



Elomatic Catalogue



Welcome to the Elomatic Catalogue!

At Elomatic our goal is to provide you with the best and most comprehensive technical consulting and engineering services, products and complete solutions for all your needs. We have the expertise and capacity to implement even the most demanding technical investments. Our ultimate goal is to make you more successful. This we believe will make us successful too.

This catalogue provides details about our services, products and turnkey solutions, as well relevant primary contact information.

Keep a watch out for online updates to your Elomatic Catalogue and don't hesitate to contact us for more information.

We look forward to offering you technical expertise that can drive your business!



CEO





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Elomatic in Brief





Intelligent Engineering

Elomatic is a leading European provider of consulting, engineering, product development and project management services, as well as products and turnkey concepts to industrial and public sector customers. We have close to 50 years' experience in completing diverse and demanding projects in a wide range of industrial fields. Our close to 1000 professionals serve our customers on a global basis. We have offices in Finland, China, India, Italy, Kazakhstan, the Netherlands, Poland, Russia, Spain and the UAE.

Our mission

Our mission is to give our customers a competitive edge and make them more successful. We exceed their expectations. With optimised and sustainable products and services, we improve living standards.

Know-how leaders

We develop top know-how and aim to be forerunners in whatever we do. This is the lifeblood of our organisation and the core of our value proposition.



Intelligent Engineering



Our customers

Our customers include both big multinationals and smaller companies. Their needs vary from once-off technical assistance and consulting up to complete turnkey deliveries of entire investments and products.

Our customers are ambitious. They are already very successful or want to become that. Our role is to ensure that their ambitions are achieved and sustained.

Our customers truly value long-term partnerships. They understand that such relationships are vital in creating true and lasting product and service value



Elomatic has been ISO-9001 quality certified since 1991

One-stop service

Our goal is to provide our clients with all the technical engineering, consulting and project management needs they require under one roof. We understand the intrinsic value of being able to procure services centrally from a single, reliable and trusted partner.

Environmental orientation

Increasingly stringent environmental legislation requires consultants with special environmental expertise. Elomatic has integrated environmental thinking into its core competences. This holds true regardless of the industrial area or product and service offering.



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- CADMATIC offices, p. 67
- Caligo Industria offices, p. 71
- Wellquip Holding website: www.wellquip.fi

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- 1 Process Industries: Pharmaceuticals, Chemicals, Food and Biomass Processing
- 2 Machinery and Equipment Manufacturing, Production Technology
- 3 Design, Engineering and Data Management Solutions

Industrial Expertise Areas





Chemicals, Food and Biomass Processing

Elomatic has extensive knowledge and experience of food, chemicals and biomass processing. Our projects include production plant expansions, modernisations, maintenance services and greenfield projects. In wheat-to-starch processing we offer turnkey deliveries. Our knowledge and experience also cover production logistics from inbound to outbound logistics with automatic data collection, management and reporting and applications like traceability and quality control.

Responsibility for the environment and sustainability together with safety are always top priorities for our project teams. Risk evaluations, process reliability studies and profound knowledge of practices and regulations related to e.g. ATEX environments are utilised in an ever increasing number of projects.

Deep domain knowledge

- Food industry: milk, vegetable oil and grain product processing and convenience food production
- Chemical and agrochemical industry: heavy chemicals, petrochemicals and fine chemicals, adhesives, polymers and active ingredients, construction chemicals and products
- Pulp and paper industry: chemical systems and recovery systems
- Biomass processing: grain, lignocellulose and waste processing into chemicals, biochemicals or liquid and gaseous fuels
- HVAC design services for industrial and public buildings
- EPCM integrated service concept including project management, engineering, procurement and construction site supervision services
- Siemens automation systems as turnkey deliveries





Flexible service delivery

Our services can be flexibly structured and combined according to the needs of each project. In some projects the best option may be a one-stop full EPCM service package covering all areas of project management, engineering in multiple disciplines, procurement, construction management and commissioning, while another project may require only engineering in a niche area. In the area of electrification, automation and IT systems we also operate as a turnkey supplier.

Our customers

Our customers include both big international companies and smaller local companies operating in the food, fine chemicals, construction chemicals, pulp and paper and petrochemical industries. In addition to our engineering professionals in Finland, we can serve our customers by complementing our teams with engineers from our engineering unit in Poland.

Broad in-house engineering scope

- Process engineering
- Plant engineering
- Mechanical engineering
- Construction engineering
- HVAC engineering
- Electrical engineering and instrumentation
- Automation system engineering
- Information system engineering

Related services

- 360°tools clear maintenance, p. 72
- EloWise Information Management Solutions, p. 76
- Laser scanning, p. 128
- Plant and Process Engineering, p. 96
- Production Engineering and Development, p. 98





Selected References

Valio Oy, Seinäjoki

Unique heat pump solution including heat and cold recovery for dairy products plant.

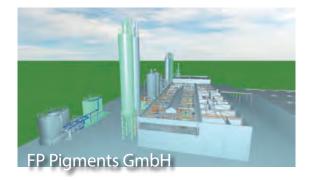
- Energy audit plan and subsidy application for energy consulting
- Industrial energy audit
- Conceptual design (project plan, cost estimates, payback calculations and investment subsidy application)
- Detailed design (process design, plant design, 3D design, technical analysis)
- Project animation for use in Valio presentations

Raisio Group / Benecol

A new, complete production facility for cholesterol lowering food ingredient

- All utilities produced in-house
- EPCM services
- 3,160 m² production area
- Atex classified areas





- Conceptual, basic and detail design, project coordination, specifications, construction supervision, commissioning and automation system supplies
- Process based on Raisio's patented know-how and technology



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Nordkalk Ltd

A new, complete production facility for crushed lime stone products

- Engineering and procurement services
- 670 m² production area (11,400 m³), steel constructions design and strength calculations for process tower, process and plant design
- Basic and detail design, project coordination and engineering services, plant and steel construction design
- Laser scanning of existing process and facilities

CP Kelco Ltd

Process and utility systems for CMC chemicals production plant

- Engineering services for production plant expansion
- Basic and detail design, project engineering services, plant, electrification, instrumentation and automation design. Site services with construction supervision, commissioning and start-up.

Kiilto Ltd

Production facility for polymerised adhesives products

- EPCM services
- 530 m² production area floor
- Basic and detail design, project coordination and engineering services, process, plant, piping, electrification, instrumentation and automation design
- Site services with construction supervision, commissioning and start-up.
- Laser Scanning of existing process and facilities
- Siemens PCS7 automation system delivery

FP Pigments GmbH

Pigments plant capacity expansion, Germany

- Multidisciplinary design, procurement, project and site management services (EPCM)
- Siemens PLC/DCS automation system supply with SCADA data analysis and reporting tools (MES)



Starch and Potato Processing

Elomatic offers a unique combination of experience and know-how regarding the processes, technologies and optimal operation of starch and food potato processing plants.

We provide our own proprietary technologies and turnkey solutions all over the world to customers that process wheat and potatoes into higher value products.

Market leader in wheat starch processing technology

Elomatic is the owner of the internationally renowned Raisio Process technology for wheat starch processing. The Raisio Process produces the highest quality Astarch and gluten possible at high yields with minimal fresh water consumption.

Elomatic's core process technology in starch technology covers (i) wheat processing into gluten, A-starch and by-products and (ii) potato processing into starch, pulp and fruit juice and (iii) barley processing into starch and animal feed.

We also have expertise in further processing or modifying starch for food and technical applications and in producing B-syrups.



Benefits of Elomatic starch technology

- Allows large variation in incoming flour quality –
 e.g. falling number can be as low as 100
- Results in the highest possible gluten and A-starch yield and quality
- Almost fully closed process water circulation, meaning less fresh water and less waste water: fresh water consumption is less than 2 m³ per tonne of wheat flour
- Comprehensive support, including management and operational support to run production with more than 30 years' experience in management and operating starch plants
- Strong experience in start-up, commissioning and staff training
- Production time up to 8,200 hours per year as maintenance and CIP cycle is only necessary every 6–7 weeks.
- Fully independent from equipment manufacturers
- 3D plant design

Turnkey solutions

Our process technology and turnkey solutions cover the entire life cycle of the plant:

- Early investment and feasibility studies
- Basic engineering
- Detailed engineering
- Start-up and commissioning
- Operation and maintenance
- Plant modifications

Related services

- Wheat Starch Technology, p. 60
- 360°tools clear maintenance, p. 72
- EloWise Information Management Solutions, p. 76
- Plant and Process Engineering, p. 96





Selected References

AB Amilina, Lithuania

- Wheat starch plant
- 2 Agglomerators for gluten separation

Wheat starch projects in Russia

- Project design phase P (Proyekt P) design and documentation according to the Russian Federation guidelines N87
- Capacities from 50,000 tonnes of wheat per year to 200,000 tonnes of wheat per year into vital wheat gluten, native wheat starch and by-products into biofuel and animal feed
- The plants are located in Omsk, Altai and Novosibirsk region

Wheat starch plants in Germany and Kazakhstan

Consultancy in process problems

Classified Customer, United Kingdom

Agglomerator delivery for gluten separation

Altia Oyj, Finland

- Barley starch dry modification plant
- Feasibility study

AB Amilina, Lithuania

Wheat starch plant with a capacity of 20 tonnes of wheat flour per hour into:

- Vital wheat gluten 2.24 t/h, ds 93%
- Native A-starch 12.7 t/h, ds 88%
- By-product 6.1 t/h, ds 88%
- Preliminary, basic and detail design, procurement, project management, equipment delivery for agglomeration and process automation and reporting system with Siemens PCS7, supervision of installation, start-up and training of personnel

Younian Golden Dragon Group, ZhangYe, China

- Production line for potato flake and granule
- Capacities: 800 kg/h of flake or 900 kg/h of granule
- Engineering, equipment delivery, supervision of installation, start-up and training of personnel

Chemicals, Food and Biomass









Shanxi Xuguang Investment Co. Ltd, China

Food potato processing plant

- Potato storage with a capacity of 70,000 tonnes of potato
- French fries production line 3,000 kg/h
- Flake line 800 kg/h
- Granule line 1,000 kg/h
- Engineering, equipment delivery, supervision of installation, start-up and training of personnel for granule line

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Russia and CIS



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East Ocean Oils & Grains Industries, Zhangjiagang, China

Wheat starch plant with a capacity of 8 tonnes of wheat flour per hour into:

- Vital wheat gluten 0.9 t/h, ds 93%
- A-starch 6 t/h, ds 60%
- B-starch slurry 3.3 t/h, ds 32.7%
- Feed slurry ds 7%
- Engineering, equipment delivery, supervision of installation, start-up and training of personnel for the wet process and gluten dryer

Henan Lianhua Gourmet Powder Co. Ltd, China

- Wheat starch plant with a capacity of 16 tonnes of wheat flour per hour into
- Vital wheat gluten 1.9 t/h, ds 93%
- A-starch slurry 21 t/h, ds 39%
- B-starch slurry 7.6 t/h, ds 32.7%
- Engineering, equipment delivery, supervision of installation, start-up and training of personnel for the wet process and gluten dryer





Pharmaceuticals

We have worked for more than two decades with both international and domestic companies within the pharmaceutical and biotech industry. In the past ten years a great number of our assignments have been in the area of biopharmaceuticals.

In industrial biotech our know-how covers all process phases from upstream processing to cultivation and downstream purification with a variety of strategies for purification processes. We also have experience of engineering work for BSL3 (biosafety level 3) facilities.

Our customers

Our customers include both big international companies and smaller local companies in Europe, India, Asia, The Middle East and Africa. We can offer our customers assignments of any size from consulting and conceptual design up to EPCM and turnkey solutions.

Good Engineering Practices – our promise to you

Elomatic's way of working complies with Good Engineering Practises that ensure time and cost savings in design, commissioning, qualification and validation of completely new or modified facilities. We are able to establish and maintain project documentation that is both technically of a high standard and that is valid throughout the whole project. This project documentation forms the backbone of the successful life cycle management of the process plant and has an effect beyond the time when the project is completed. The proof of our know-how and experience in biotech and pharma are the numerous facilities we have worked on that have passed inspections by EMEA or FDA.

Deep domain knowledge

- Biotechnical manufacturing processes
- Biopharmaceuticals
- All pharmaceutical dosage forms



- Highly potent compounds in manufacturing
- Diagnostics production
- Clean utility systems
- Clean rooms
- Automation (according to GAMP)
- Commissioning, qualifications and validation
- Regulatory and quality issues



Broad in-house engineering scope

- Process engineering
- Plant engineering
- Mechanical engineering
- Construction engineering
- HVAC engineering
- Electrical engineering and instrumentation
- Automation system engineering
- Information system engineering

Related services

- Electrical, Instrumentation, Automation & IT, p. 86
- Machine Safety and CE Marking, p. 111
- Plant and Process Engineering, p. 96
- Validations Services, p. 113



Ministry of Health and Medical Industry of Turkmenistan

Turnkey delivery of a new infusion solution factory

- Process equipment
- Laboratory equipment and furniture
- Clean utility equipment
- Clean rooms and clean room HVAC
- Piping and electrical installations
- Automation
- Commissioning, start-up and validations

Cytomed Oy

Rebuilding of existing workshop

- In the first phase 440 m² clean room area, grade D areas (EU GMP) for capsules, dry syrups, creams, ointments and suppositories
- Space for future expansion for sterile ampoule filling facility
- Basic and detail design, all official applications, equipment specifications, construction supervision and validation of process, HVAC and clean rooms

O-Med

A new, complete production facility for aesthetics injections

- All utilities produced in-house
- 624 m² clean room area, class 7 and 8 areas (ISO 14644-1)
- Conceptual, basic and detail design, project coordination, specifications, construction supervision, commissioning and validation
- European authorities approved factory for production and FDA

Pfizer Health

Production Facility for Tumor Therapeutic Antibodies (TTMA)

- All utilities produced in-house
- 260 m² clean room area, grade C and D areas (EU GMP)
- Basic and detail design, project coordination, specifications, construction supervision, commissioning and validation

Pharmaceuticals







Biovitrum Ab Stockholm

Biotech pilot plant including cell culture fermentation, purification, clean utility and other utility systems

- All utilities produced in-house
- 380 m² clean room area, class 7 and 8 (ISO 14644-1)
- Basic and detail design, process and clean room design

Orion Oyj

A new building expansion connected to existing hormone gel department.

Final result

- 6,000 m² on four floors
- 1,300 m² Clean rooms class 8 (ISO 14644)
- Warehouse and loading bays
- Stability study chambers
- New tank farm outside for storage of flammable clean utilities (ATEX)
- Manufacturing equipment: isolator, washing machines, holding tank (ATEX), filling & packaging line
- Clean utility piping

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Elomatic scope

- Project coordination for all disciplines and project phases
- Production ongoing during building, short stops for connecting new and old areas
- Process, plant, HVAC design for conceptual, basic and detail design including 3D modelling (CADMATIC and other software)
- Documentation for procurement, construction supervision, commissioning & validation supervision





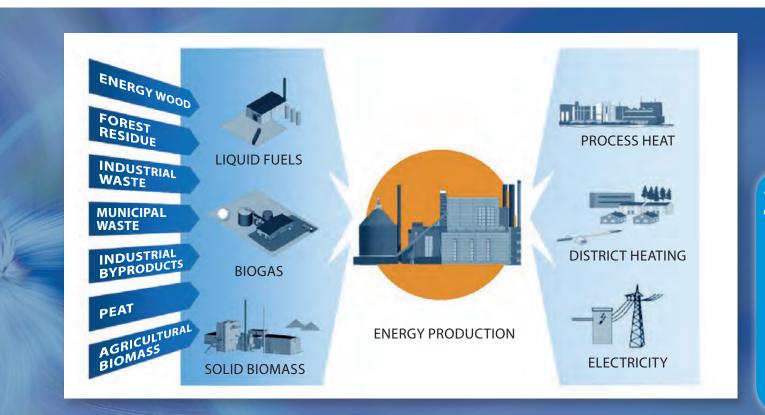
Energy

Elomatic provides consulting and engineering services both for industrial and public sector customers throughout the energy value chain, from fuel refining and energy production up to efficient distribution and use of energy at the end use point.

Our experience covers both fossil fuel-based energy production as well as renewable, biomass-based energy production.

Biofuel refining

Based on our heritage in biotechnology, biomass processing and chemical engineering we have a strong knowledge base in converting biomass to biofuels, either to liquids (such as wheat-to-starch-to-bioethanol), gases (such as agricultural waste-to-biomethane or gasification of biomass into syngas) or solids (such as biomaterial-to-pellets).



Energy production and distribution

In energy production we are familiar with forest industry energy systems, recovery boilers, conventional steam power plants, CHP plants and diesel power stations, as well as novel energy generation technologies such as gasification, micro turbines, ORC and heat pump applications.

In energy distribution we have extensive know-how that covers various types of heating and cooling networks, including district heating and district cooling networks and various steam, hot water or hot oil networks

We offer our customers a wide range of services from project concept design to detailed design and implementation.

Deep domain knowledge

- Energy consulting
- Biofuels
- Energy generation
- Energy distribution
- Energy efficiency
- Heat recovery systems

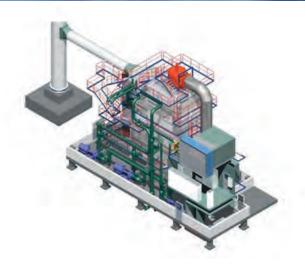
Broad in-house engineering scope

- Process engineering
- Plant engineering
- Mechanical engineering
- Construction engineering
- HVAC engineering
- Electrical engineering and instrumentation
- Automation system engineering
- Information system engineering









Selected References

Leppäkosken Sähkö Oy

Reserve and peak output project

■ Elomatic scope:

Plant project consultation (20 MW), environmental permit and dispersion modelling, construction management, construction design, process design, piping modifications, natural gas coupling, electrical and instrumentation design, supervision

Fortum Power and Heat Oy

Case: Fortum Joensuu. Flue gas scrubber plant for liksenvaara power plant. Elomatic scope:

- Project management
- Structural design
- Building works
- HVAC design
- Design of connections to outer systems

Fortum Power and Heat Oy

40 MW Reserve and peaking heating plant, Nepenmä-ki. Elomatic scope:

- Project management
- Structural design
- Building works
- HVAC design
- Design of connections to outer systems

Riikinvoima Oy, Eco Powerplant Varkaus

Elomatic scope:

1. District heating transfer piping from Eco Powerplant to District heating network of Varkauden Aluelämpö Oy. (Riikinvoima Oy)

- DN400
- **7,500 m**
- In addition, water pipes 5,000 m
- Detail implementation design
- Distribution network simulation
- Tendering (materials + main contracting)
- Tender evaluation



- 2. District heating pumping station complete engineering (Varkauden Aluelämpö Oy)
- Foundation and structural design
- Process design
- Plant design
- Electrical design
- 3. Layout design, turbine hall (Andritz)
- 4. Turbine hall BoP area piping design (Energico Oy)

Jyväskylän Voima Oy

Engineering for CHP plant

- Boiler: CFB Foster Wheeler 480 MW_{th}, 160 bar(a) 560°C. Electricity production: 210 MW_e. Cogenerated heat: 250 MW. Fuels: biomass, wood chips, forest residue and peat
- Elomatic scope: Boiler area: P&I Diagrams. Turbine area: turbine internal piping systems, low and high pressure piping systems in Bop area, working platforms steel constructions, auxiliary piping connections, pip-

ing sizing and final construction drawings, implementation supervision. Auxiliary systems: flue gas duck, all internal steel structure parts in stack, process simulations to heavy oil systems, existing heavy oil receiving station relocation, office and maintenance building HVAC engineering

Raahen Voima / Energico Oy

Power plant in connection with steel mill located in Raahe (furnace and coke gas):

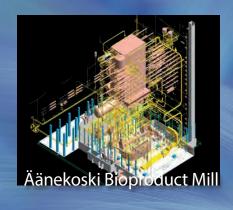
- Steam turbine electrical power 124 MWe +30 MW_{db}
- Main steam properties 110 bar(g), 550°C
- Main steam pipe size DN 300x22

Elomatic scope:

- Turbine island layout and piping design (Energico Oy)
- High Pressure steam system process and piping design, turbine island (Raahen Voima Oy)
- Piping pressure equipment calculation and stress analyses EN 13480









Vapo Oy and KPA Unicon Oy

6 MW Steam boiler plant for Valio in Jyväskylä, Finland

- Elomatic scope for Vapo Oy: Overall coordination of design, area layout design, structural design, discharge duct design, process design, piping and pipe bridge design, electrical and instrumentation design, CE marking, construction management, request for bids, ATEX, fire technical design
- Elomatic scope for KPA Unicon Oy: Process design, plant design, structural design, HVAC design

KPA Unicon Oy

Water-tube boiler construction engineering 3x25 MW_{th}

Elomatic scope:
 Boiler engineering and pressure vessel calculation, grate, boiler furnace, steam drum, downcomers, superheaters, second pass structure, economiser, air pre-heater, air ducts, thermal insulation, brickwork and casing engineering

Turun Energia Oy

Heat pump plant

- Heat pumps: Friotherm AS, heat source: clean municipal waste water +10°C – +18°C, cold water accumulator: 17,000 m³
- Phase 1: energy production 19.5 MW heat and 13.0 MW cold, electricity consumption 6.5 MW
- Phase 2: energy production 18.2 MW heat and
 12.0 MW cold, electricity consumption: 6.2 MW
- Elomatic scope:
 Plant engineering, project management and site supervision services, process equipment layout and piping design, architectural, building and HVAC engineering, EIA engineering

KPA Unicon Oy

Over 70 thermal biomass plants ranging from 2.5 MW_{th} to 2x17 MW_{th} .

Elomatic scope: Preliminary design and tender document preparation, process design, equipment and power plant layout design, power plant and civil construction steel structure design, pressure vessel and piping sizing, biomass feed-system, process piping design, civil construction design

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Äänekoski Bioproduct Mill/Valmet Oy

Metsä Fibre Äänekoski – Basic design and detail design of recovery boiler high pressure and process piping. Design parameters:

- Recovery boiler production rate 7,200 tn/day dry mass
- Main steam properties 145bar(g), 530°C
- Main steam pipe size DN 650x45
- Steam turbine electrical power 260 MWe

Elomatic scope:

- PDMS 3D piping design
- Piping pressure equipment calculation and stress analyses EN 12952 & EN 13480
- High pressure piping ~7,5 km
- Process piping ~10,5 km

Related services

- 360°tools clear maintenance, p. 72
- Caligo patented flue gas treatment and process waste heat recovery system, p. 68
- Electrical, Instrumentation, Automation & IT, p. 86
- Energy Audit Services, p. 104
- FORMIOT Data Analysis Services, p. 102
- Process Industries, p. 14

We have completed more than 130 diesel power plant projects in over 40 countries around the world.





Machinery and Equipment Manufacturing

Elomatic provides a wide range of design, consulting and other services for manufacturers of machinery and equipment. We are involved in our customers' R&D projects, in product design and in production development.

Our design services are often aimed at our customers' demanding investment projects with co-operation that has evolved over a long period of time. This has enabled us to develop our operations very efficiently in relation to product expertise, personal skills, operating processes and tools.

Creativity and innovation in R&D

In our customers' R&D projects the nature of the work is very innovative, creative and customer-centred. Product expertise is important, but special skills in different fields such as structural analyses, flow calculations, material know-how and production technology all play key roles.

We are involved all the way from concept design and idea generation to the detailed planning of R&D projects and, if necessary, we seek suitable manufacturing subcontractors for products. Our services extend to surveys of end users and usability analyses to ensure the success of a new product in the marketplace.

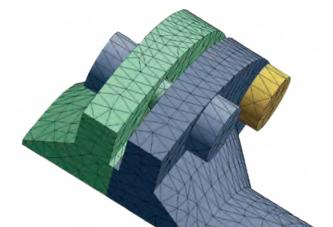




Getting the most out of production systems

Our production analysis service covers production planning and production-centred R&D of either new or existing products. We use different simulation models to identify the best solutions for our customers in order to boost the competitiveness of their products.

We have experts in such fields as production flows and masters of robotics. Our specialists are constantly seeking new ideas and learning about different technologies to keep our expertise at the highest level for the benefit of our customers.



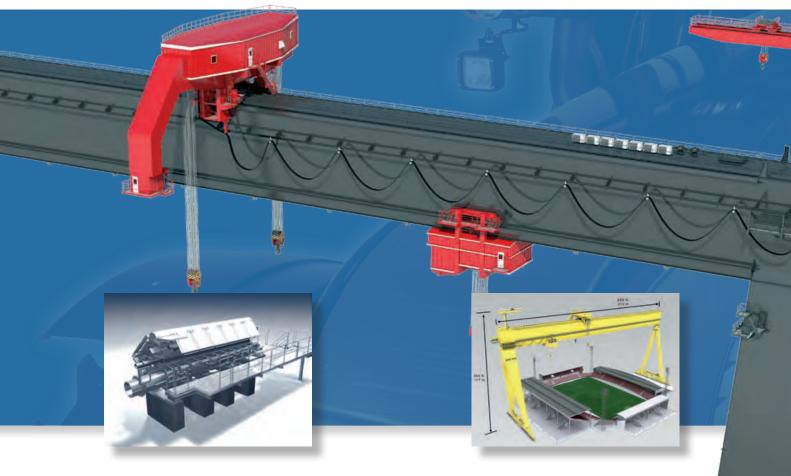
Optimising production technologies and product design

Our industrial designers get involved in projects at the earliest design phases. They seek optimal solutions with regards production technology in order to ensure the competitiveness of our customers' products.

At the same time, the visual appearance of the products is also improved. In order to ensure product usability and a good user experience many people specially trained in this field are involved in our service. The service covers not only usability training, but also comprehensive user-centric design, which aims to achieve the optimal end result through evaluation, simulation and testing.

The physical and mental limitations of people should increasingly be taken into account in product design. Through visualisation we can illustrate how a device or machine functions. Visualisation is also used to assist in training and marketing. To this end, we also have first-class tools at our disposal.





Paper machines

For more than 20 years we have been engaged in mechanical, plant and process design for companies specialised in paper, board and pulp technologies.

In paper machines we are specialised in handling the paper and board industry's demanding upgrade and modernisation projects. Our design services are focused on the mechanical design of different assembly groups and components for paper and board machinery, including all phases from conceptual and product development to implementation and installation supervision.

Paper machine expertise areas

- Headboxes
- Forming sections
- Press sections
- Dryer sections
- Component engineering
- Paper and board machines

Cranes

Elomatic has been engaged in crane design since 1976 when we received our first commissions from Kone Oy. The cooperation that began at that time is ongoing and at present our main customer is Konecranes Finland Oy.

In addition to traditional steel structure and outfitting design, Elomatic's part in crane projects includes installation and transport planning, strength calculations, electrical planning, and production control for domestic and international projects.

Crane expertise areas

Elomatic's experience mainly comprises four types of cranes, of which 80–90 units in total have been produced:

- Container gantry cranes
- Grab unloaders
- Shipbuilding gantry cranes
- Shipboard gantry cranes
- EIA & IT, p. 86
- Technical Analysis, p. 130



Vehicles

Elomatic's know-how covers more than 30 years of demanding design work for different vehicles and their applications.

Our vehicle projects often include not only the preparation of traditional drawings, but also structural calculations, modelling, usability, electrical engineering, visualisation and the preparation of operating and maintenance instructions.

Our customers include Valtra, Sandvik Mining and Construction, Transtech, Vapo, Kesla and RCM Harveri. With many of our customers we have developed long-term product development relationships, some of which have been ongoing for more than two decades.

Vehicle expertise areas

- Tractors
- Mining vehicles
- Trailers
- Harvesters

Machines and production devices

Elomatic has extensive experience in delivering design and implementation services for different production machines and devices. We have specialised know-how for tailor-made production machines, test benches, material handling machines, as well as welding jigs, machining jigs and assembly jigs for different industrial application areas.

In the preliminary design phase, modern visual design systems allow us to create virtual assembly areas where different solutions can be studied instead of building expensive prototypes. In addition to normal design deliveries our projects typically include, among others, the necessary investment calculations, structural analyses, visualisations and electrical and automation solutions.

Machine and production device expertise areas

- Test benches
- Special production machines
- Material handling equipment and tools
- Assembly jigs
- Welding jigs
- Accessory tools
- Aerospace tools









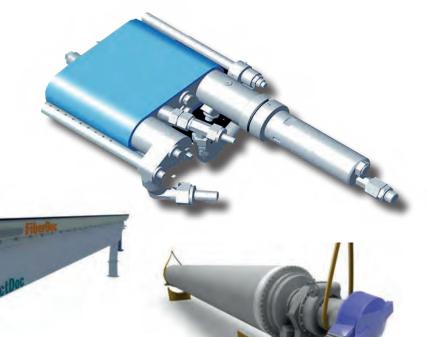


Selected References

Paper machines

Paper, board and pulp drying machines, Valmet Technologies, Inc

- Mechanical engineering since 1985 throughout the whole process from headbox to winder
- New lines and rebuilds
- Component engineering: rolls, doctors, tail threading, etc.
- From pre-engineering and sales layouts to erection supervision and start-ups
- R&D projects and pilot machines





Machinery and Equipment











Cranes

Shipbuilding cranes

- Different shipbuilding crane projects since 1976
- Lifting capacity 300–1,800 tonnes
- Effective span up to 200 m
- Lifting height up to 114 m

Container gantry cranes

- Different container crane projects since 1976
- Lifting capacity 40–65 tonnes

Gantry grab cranes

- Different grab crane projects since 1976
- Lifting capacity 22–80 tonnes

Shipboard gantry cranes

- Different shipboard gantry crane projects since 1997
- Lifting capacity 40–68 tonnes

Vehicles

Tractors

Valtra Ltd

- Cabin, chassis solutions, equipment
- Test benches, production line jigs, accessory tools
- Animations
- Transmission assembly machines, accessory tools
- Design Catia 3D

Foresting machines

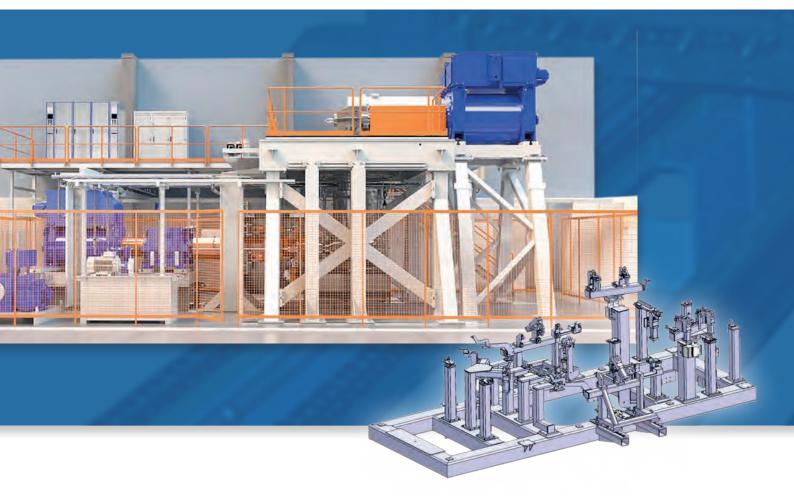
Kesla Ltd

- Increasing carrying capacity
- Structural optimisation
- Structural analysis, chopper, structural changes, Design Inventor 3D

Mining vehicles

Normet, Sandvik





Machines and production devices

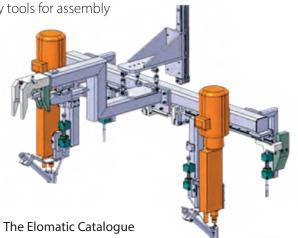
Production development

Diverse projects in a range of industrial areas that include:

- New factories
- Developing existing factories
- Series production
- Material handling

Automotive industry jigs and tools

- Welding jigs
- Assembly jigs
- Accessory tools for assembly



Engineering works jigs

- Welding jigs
- Machining jigs
- Assembly jigs

Aerospace industry

- Lamination and trimming jigs
- Assembly jigs
- Drill guides and machining brackets





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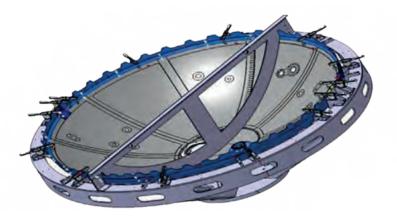
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Related services

- Computational Fluid Dynamics (CFD), see Technical Analysis, p. 130
- Electrical, Instrumentation, Automation & IT, p. 86
- Health, Safety and Environment, p. 110
- Machine Safety and CE Marking, p. 111
- Mechanical Engineering, p. 94
- Product and Service Development, p. 114
- Production Engineering and Development, p. 98
- Technical Analysis, p. 130
- Visualisation, p. 124





Marine

Elomatic provides a wide range of marine life cycle services that comprehensively meet maritime stakeholders' divergent needs; from concept and project design all the way to newbuilding and operability support. In customer projects we apply our expertise and creativity to deliver services and products of the highest quality and reliability to shipyards, shipowners and operators, equipment and turnkey suppliers and many more in the maritime industry.

Full product life cycle – all design disciplines

Our services cover all disciplines and the full life cycle of the products from feasibility studies and pre-design to detail design, production support, site supervision and life cycle support.

- Project and concept design
- Marine design and engineering
- Newbuilding support
- Environmental retrofit support
- Information management solutions
- Technology and operability support

Way of working

We have successfully completed a variety of different consulting, design and engineering projects, among them projects that have involved up to 200 of our engineers. For each large project we form a project group carefully managed and manned with experts from the various teams within our office network, and if required from partner companies.

We have the unique possibility to combine design and software development resources under the global Elomatic control and management to guarantee excellent quality products and services at a competitive price. With our sophisticated engineering and communication tools we can distribute the design and review work between our offices. Using the same technology, our customers may follow up project progress in real time.

International network of offices

Elomatic serves the marine industry from four offices each specialised in different engineering and consulting areas related to shipbuilding and ship operation. Two of the offices are located in Finland (Turku and Helsinki), one in Poland (Gdańsk) and one in Serbia (Belgrade).

Related services

- Automation, see Electrical, Instrumentation, Automation & IT, p. 86
- Computational Fluid Dynamics (CFD), see Technical Analysis, p. 130
- Electrification, see Electrical, Instrumentation, Automation & IT, p. 86
- Health, Safety and Environment, p. 110
- Strength Calculations (FEM), see Technical Analysis, p. 130
- Visualisation, p. 124

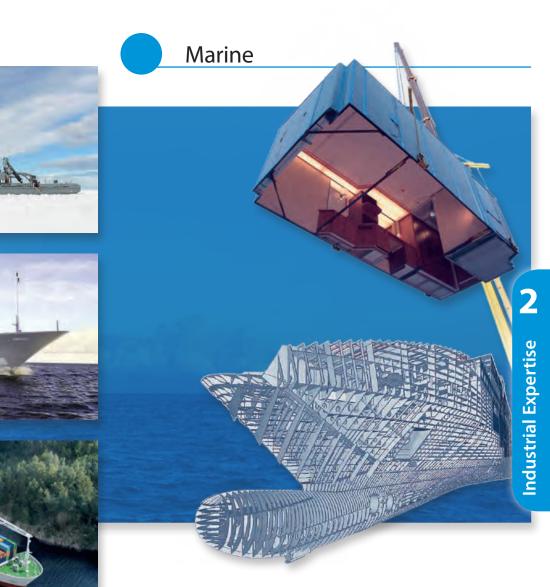


Our expert teams are capable of carrying out any assignment related to basic or detailed engineering of any type of seagoing vessel. We have accumulated experience from a wide range of different assignments for shipyards as well as turnkey and equipment suppliers. Our skills cover all design disciplines including ship theory, hull and structures, machinery, HVAC, deck, interior and cabin design as well as electrical systems.

Basic design

We take care of the complete pre-design and classification package required for the successful continuation of ship design and production. In addition to our teams focused on ship design we utilise Elomatic's specialist skills for FEA and structural analyses, flow calculations and visualisations.

- Strength analysis, FEM and CFD calculations
- Classification calculations for steel structures
- Structural classification drawings
- Layouts for machinery and other technical areas
- Diagrams for machinery and auxiliary systems
- Propulsion arrangements and calculations
- Machinery automation
- Architectural design, material specifications
- Layouts of accommodation, public and crew areas
- Cabin layouts and modular cabin mock-ups
- Catering systems and arrangements
- Staircase arrangements
- Escape calculations, plans, and analysis
- Arrangements of lifeboat and mooring decks
- Structural fire protection and insulation plans
- Diagrams for HVAC systems
- Power generation and distribution
- Lighting, communication, and alarm systems
- System calculations
- 3D modelling, routing and visualisations
- Procurement support



Detail design

11111

Most of the work is performed utilising sophisticated 3D software such as CADMATIC and AVEVA Marine. By using 3D design we generate a comprehensive and accurate model to integrate machinery, equipment, piping, ducting and cable trays with the steel structures. Based on the model we produce the necessary drawings, part lists and CNC data. With our eBrowser software we use the virtual model for visualisation in the design process and also during construction at the shipyard.

- Detailed layouts of machinery, technical spaces, public, crew, and accommodation areas
- Detailed arrangements of lifeboat and mooring decks
- Complete 3D product models
- Prefabrication drawings for e.g. machinery and interior modules
- Pipe packages, isometrics, and spools
- Electrical cabling, connection, and circuit diagrams
- Material and part lists, assembly drawings
- Nesting of plates and profiles

- Cutting and bending data for steel structures and pipes
- Detailed weight calculation with COG

Prefabrication and modularisation

Elomatic has a long and successful track record of delivering innovative ideas for modularisation, prefabrication technology and its applications.

The most significant benefits of prefabrication technology are gained from moving a major part of the work from the ship into workshops. The benefits gained increase exponentially with the complexity of the prefabricated modules introduced. Elomatic has experience of designing big pre-fabricated modules such as engine casings and AC Rooms.

We have designed modular crew and passenger cabins since 1984 for more than 100 different vessels and we have also carried out the design of public spaces for cruise ships based on 100% prefabricated modules.



Marine Life Cycle Solutions

Elomatic provides a wide range of services for Shipowners. The assignments may be specific one-off studies or comprehensive design and engineering projects and may cover any phase of the vessel's life cycle. Our goal to create quality products and services is achieved by combining creativity with technical expertise.

Elomatic offers experienced staff in all disciplines of naval architecture, marine engineering and project management to assist in both newbuilding projects and conversions.

We also supply special services such as laser scanning, 3D modelling, exterior design, architectural design and coordination as well as various visualisation tasks

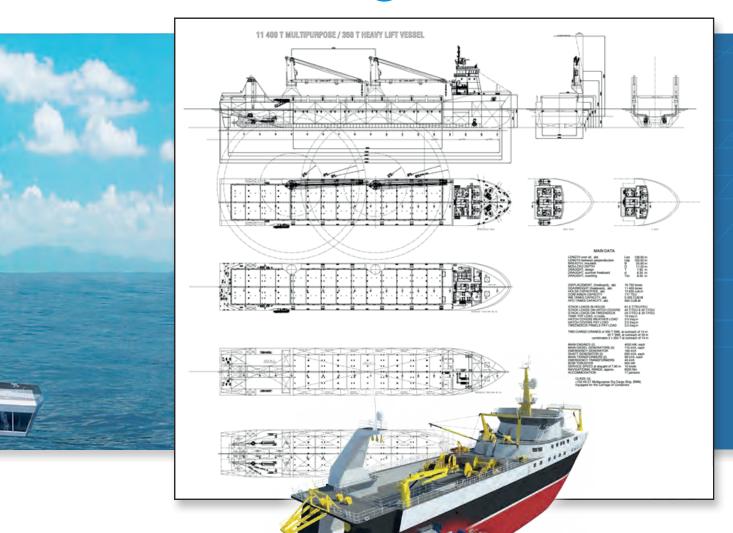
Concept and project design

We identify the Shipowner's needs and develop the ideas into feasible concepts and solutions. Our excellent naval architectural skills and advanced design tools combined with our profound knowledge of the required rules and regulations ensure the good performance of the vessel. All project materials needed for a shipbuilding contract can be produced by Elomatic. We also provide services related to bid evaluation and contract negotiations.

Naval architecture

- General arrangement
- Machinery arrangement
- Building specifications
- Conversion specifications
- Hull form development
- Resistance and propulsion
- Coordination of model tests
- Sea keeping and load analysis
- Noise and vibration studies
- Rules and legislation follow-up





Hull form and hydrostatics

- Intact stability calculations
- Damage stability calculations
- Ship weight control
- Inclining tests and stability material updates
- On board NAPA support

Safety

Hydrostatics and stability

- Safety studies and evaluations
- Safe return to port
- Structural fire protection
- Fire safety
- Life saving appliances
- Environmental Retrofits, p. 46
- Health, Safety and Environment, p. 110
- Information Management Solutions, p. 47

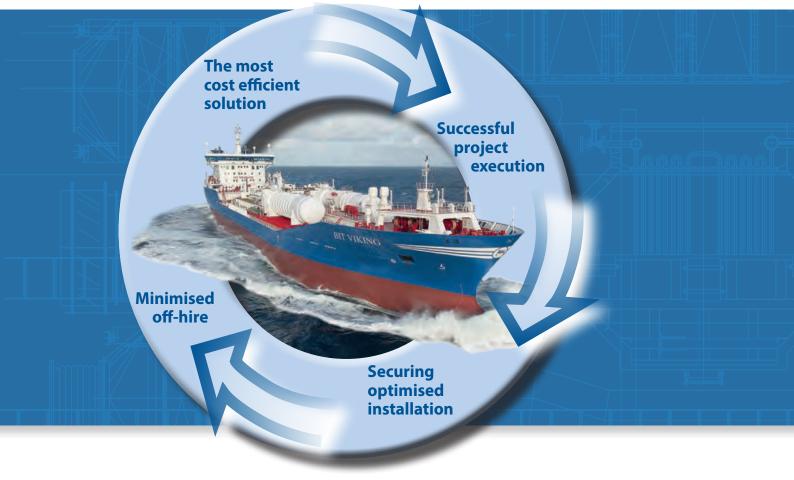
Technology and operability support

Elomatic provides sophisticated operability studies, structural and safety analyses, energy efficiency studies, and simulations to aid smooth operation and solve actual or potential problems on board. We carry out studies in various stages of a project to support the decision making process and help selecting the appropriate technologies and solutions.

Newbuilding support

Elomatic provides support for the selection of building yards and related negotiations. When a newbuilding contract has been signed we can form or take part in an on-site inspection team that takes care of plan approval and on-site supervision. We assist the shipowner with project management and coordination and after delivery we provide guarantee support and perform troubleshooting on board.





Environmental Retrofit Support

Our retrofit services are focused on ballast water management, sulphur scrubbers and other exhaust gas cleaning solutions, alternative fuels such as LNG and energy savings.

Exhaust gas purification

Every ship is unique and requires a comprehensive evaluation when selecting and planning sulphur oxide (SO_x) and nitrogen oxide (NO_x) emissions reductions.

Ballast Water

There are several technical, operational and cost considerations that have to be taken into account when choosing the right ballast water management solution.

Alternative fuels

Exhaust gas emissions can be reduced by using alternative fuels to heavy fuel oil such as marine diesel oil or LNG. Dual fuel operation may also be an alternative.

Efficiency

Saving energy means reducing both costs and emissions. There is a wide range of technical and operational measures that can be introduced on existing ships in order to achieve these goals.

Environmental services and solutions

- Environmental maritime consultancy, technology evaluations, impact assessments, and legislation follow up
- Energy efficiency and optimisation
- Emissions and carbon footprint calculations
- Technology retrofit projects

Technology retrofits

- Feasibility studies and ship inspections
- Technology evaluations and cost estimations
- As built verification using laser scanning
- Integration design, classification documentation
- Detail design and workshop drawings
- Project management and supervision



Information Management Solutions

To improve your ships' operational performance Elomatic offers solutions to generate, organise and integrate technical information. Our EloWise software combines operational management e.g. maintenance functions with document and equipment management, supported by an easy-to-use 3D model user interface. Additional benefits are gained through improved communication and training. We offer qualified support for implementation and updating.

Benefits

- Cost savings
- Easy access to information
- Reliable maintenance
- Trouble free retrofits
- Improved communication & training
- Support for updates & implementation
- See pg. 76 for a detailed overview of EloWise software.







Selected References

Cruise ships and ferries

Global Class Vessel

204,000 GT under construction at MV Werften, Germany, for Genting, Hong Kong.

- One of the biggest cruise ships in world
- Project size: 430 man-years
- Basic and detail design
- System engineering
- Site assistance during construction

Viking Grace

57,500 GT LNG operated cruise ferry built by STX Finland for Viking Line.

- Basic design for LNG piping including calculations
- Architectural design of passenger cabins
- Detail design for hull, main engine rooms, deck outfitting including LNG tank and bunkering areas, cabins and cabin areas
- Preparation of workshop drawings, prefabrication drawings, material lists

Aida Prima

124,500 GT cruise ship built by Mitsubishi Heavy Industries, Japan for AIDA Cruises.

- Coordination design of several main fire zones using CADMATIC and MHI Mates software
- Coordination design specialist work and production coordination and supervision at yard in Nagasaki
- Interior design for SPA area for turnkey company

Mein Schiff 3–6

Cruise ships built by STX Finland / Meyer Turku for TUI Cruises.

- Basic design and diagrams for hull structures, HVAC, interior, machinery, deck outfitting and electrical systems
- Interior and HVAC detail design for several areas
- Detail design for modular cabins and sky suites

Oasis and Allure of the Seas

225,000 GT Cruise vessels built by STX Finland, Turku for Royal Caribbean Cruises.





 Basic design for one third of the vessel including all disciplines

Louhi

 Detailed design for extensive part of hull, machinery, AC rooms and passenger outer decks, in total over 450,000 design hours

Color SuperSpeed I & II

33,500 GT RoPax ferries built by Aker Yards, Rauma for Color Line.

- Basic design for hull, machinery, safety and electrical systems. Participation in basic design for interior, deck outfitting and HVAC
- Detailed design for electrical systems, forward half of the hull and part of the machinery areas

Special vessels

Gullmaren

80 cars / 297 pax road ferry built by Uusikaupunki Workboat for Färjerederiet Sweden.

- Ship theory calculations, hull classification design
- FEM analyses for ramps
- ME layout and machinery/ piping detail design with 3D CADMATIC

MCMV 2010 Katanpää, Purunpää and Vahterpää

MCMV 2010 class mine countermeasure vessels built at Intermarine, Italy for the Finnish Navy.

- Detail design of machinery and HVAC systems using CADMATIC
- Technology transfer and on-site design support

Louhi

Multipurpose icebreaking oil recovery vessel built by Uki Workboat, Finland for the Finnish Environmental Institute SYKE.

- Updating of basic design
- Detail design for all design disciplines covering the entire vessel using CADMATIC, Tribon M3 and AutoCad

Norilskiy Nickel

14,500 DWT diesel electric double acting icebreaking container/cargo vessel built at Aker Yards Helsinki for OJSC MMC Norilsk Nickel.

- Basic design for hull, machinery and HVAC
- FEM calculations
- Detail design for hull, machinery and deck outfitting











NYK Super Eco Ship 2050

Marine concepts

Turva, UVL 10

Concept development of multipurpose offshore patrol vessel with functions for prevention of environmental damage, search and rescue, and different underwater assignments.

 Complete concept design for LNG application development, machinery arrangement, machinery system calculations and specification

NYK Super Eco Ship 2050

Innovative concept design of a futuristic, environmentally-friendly and low-emission container ship for MTI / NYK Line, Japan. Elomatic cooperated with MTI, the NYK Line research institute, to develop a Pure Car and Truck Carrier (PCTC) that meets future demand with a 35% reduction in ship resistance, 70% lower energy consumption and with zero emissions to air and water.

Utopia

105,000 GT residential ship concept developed for Utopia Residences. The ship is intended for worldwide cruising with 190 ultra-luxurious estates.

- Concept development, stability analyses
- Full building specification





Attila

Backhoe dredger Attila for Wasa Dredging.

- Project development jointly with Wasa Dredging
- Hydrostatics and stability calculations
- Hull classification
- Basic design and outfitting design

Conversions and retrofits

Color SuperSpeed 2, scrubber retrofit

Exhaust gas scrubber retrofit design for Color Line vessel Color SuperSpeed 2.

Basic and detail design including 3D modelling

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Norsepower Rotor Sail

Development of Rotor Sail construction and pilot installation on M/V Estraden

- Feasibility study, mechanical design of rotor and rotor components
- FEM analysis of the composite rotor, FEM analysis of rotor tower and supporting structures
- Basic and detail design for pilot installation on M/V Estraden

Bit Viking, LNG retrofit

LNG Pack retrofit design for chemical tanker Bit Viking. The work was done for Wärtsilä.

- Laser scanning
- Exhaust stack gas flow calculations in emergency case and burst disc solution
- LNG pipe, strength calculations, flow calculations
- 3D modelling and detail design, site assistance

Crystal Symphony, refurbishment of spa area

- Concept and detailed engineering for the interior refurbishment work
- Complete modular design of spa area

BWT retrofits

- Ballast Water treatment system study for Neste oil tankers: Mastera, Tempera, Futura, Jurmo, Purha, Neste. Suula and Kiisla.
- Tanker fleet BWT technology evaluation and integration design
- Detail design for a 3700 pure car carrier (PCC)

Information management

Turva

EloWise was selected by the Finnish Border Guard as the maintenance and technical data administration tool for the new offshore patrol vessel TURVA built by STX Finland in Rauma.

- The system was customised and the data structure was defined by Elomatic to fulfil the operator's requirements
- The data entry was made in close cooperation between the operator, the yard and Elomatic

We have completed over 4,000 marine projects for more than 1,000 vessels.





Offshore

Our offshore services include conceptual design, engineering, procurement, project management and EPC turnkey deliveries for offshore hydrocarbon production.

We specialise in arctic offshore with an emphasis on the Russian Federation and the Caspian Sea region. We have developed a unique fixed-ice resistant offshore platform for arctic and Caspian Sea shallow water developments.

We combine traditional offshore EPC services and our shallow water arctic platform concept with hydrocarbon production and well service applications for new or mature offshore fields.

Key service areas

- Front end engineering studies
- Concept design and engineering
- Modernisations and winterisations
- Life cycle support and solutions
- Project management and consulting
- Equipment and products: drilling, production facilities and newbuildings
- Construction and commissioning mid-size to EPC
- Offshore production systems horizontal and multi-well offshore applications
- Electrical, instrumentation & IT
- Offshore safety expertise and analyses
- Environmental considerations
- Process technology expertise
- Offshore energy generation

Laser Scanning, p. 128



Anchor Handling Support Vessel

Full range of offshore design disciplines

Elomatic is a leading designer of ship and platform structures and systems. We are strong in the area of HVAC, electrical, deck outfitting and interior design of accommodation areas (LQ), and we also have vast experience in hull structure design as well as machinery and piping system and workshop design.

- Structural design and engineering
- Architectural and interior design
- Machinery and piping
- Deck outfitting
- Electrical and automation
- **HVAC**
- Transportation analysis
- HVAC Engineering, p. 92
- Mechanical Engineering, p. 94
- Plant and Process Engineering, p. 96

Specialised EIA & IT know-how

Elomatic's EIA & IT know-how covers all the electrical. instrumentation and automation requirements of demanding offshore projects. This is complemented by our expert IT know-how, which enables us to provide our customers with comprehensive offshore EIA & IT solutions.

- ATEX-classified areas
- Risk analysis and safety integrity specifications
- Engineering supervising and coordination ser-
- Design, commission and start-up services of automation (DCS) and programmable logic controller (PLC) systems
- Electrical, Instrumentation, Automation & IT, p. 86









Elomatic Concept Design ELO WM 120

Selected References

Europlan Engineering Oy

Oil drilling rig, Cosco Platform Labin

- Accommodation plans
- Ceiling plans, floor covering and window scheme
- Fire protection plan, emergency exit plan
- HVAC diagrams, HVAC coordination drawings
- AC room layouts

Gazprom

SSFDR Polar Lights and SSFDR Polar Star. Client technical representative for newbuilds.

- Conceptual and detailed engineering review and approval
- Vendor coordination
- Quality assurance support
- Project monitoring support
- Work inspection support

Jack-Up Amazone

 Various modernisation turnkey supplies e.g. mast & drilling package

Lukoil, BKE Shelf

Jack-Up Astra

Various modernisation turnkey supplies

ArktikmorNeftegazRazvedka

Project design for modernisation of BOP systems for drillship "Deep Venture"

- Conceptual engineering
- Specification, sourcing and evaluation of 15k BOP system – both new and second hand alternatives
- Refurbishment specifications for turnkey modernisation

Technip Offshore Finland Oy

SPAR-type oil rigs

- Steel structural design
- Outfitting design

Pipe laying vessel conversion

Detailed hull design



Contact Information



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Elomatic concept design vessel

Offshore construction Vessel ELO WM 120

- Multi-task capabilities with varying mixes of heavy lift, ROV deployment, pipe laying and diving
- Shallow water ice-class PSV

STX Vietnam Offshore, Vietnam

AH08 Anchor Handling Support vessel

 Extensive design update including basic and detail design using CADMATIC

Ulstein Engineering

SX130 – Platform Supply Vessel

- 3D piping coordination
- Piping system and ISO drawings
- Hull workshop documentation

Azerbaijan International Operating Company (AIOC), Kvaerner Masa-Yards, Norway

Israfil Guseinov – pipe laying barge in Baku, Azerbaijan

- Supervising of refurbishment work
- Supervision and commissioning of machinery areas, safety plans and instructions for safety equipment on board.

Kvaerner Oil & Gas / Esso

Jotun Field FPSO hull

 Hull classification, interior layouts, schemes and workshop drawings, detail design of service hatches

Offshore R&D

Conceptual design of shallow water ice resistant fixed platform for Arctic shelf areas (Patent applied)

Aker Offshore Oy

Offshore installation barge in Krasnye Barrikady shipyard in Astrakhan, Russia

- Hull detail design, piping design of ballast and sounding piping and instrumentation design
- Mechanical design of anchor windlass, stairs, platforms and hand-rails, installation supervising and commissioning of piping systems and ventilation
- Commissioning of diesel generators, documentation of operation manuals and testing procedures

COS

Volgograd Wipimorneft

Filanowski LQP-2 platform, helideck and connecting bridge

Elomatic Turnkey Concepts





Sterile Liquid Plants

Elomatic offers customers in the Bio & Pharmaceutical industry turnkey deliveries of sterile liquid plants (SVP, LVP). Our extensive experience in the biotech sector is complemented by our strong know-how in EIA&IT, clean rooms and clean utility equipment.

We comply with good engineering practices. Our goal is to create added value for our customers: time and cost savings in design, commissioning, qualification and validation. The proof of our know-how and experience are the numerous facilities we have worked on that have passed inspections by the EMEA or FDA.

Our mission is to place our more than two decades of experience in the pharmaceutical and biotech industry at your disposal to ensure that your sterile liquid plant not only complies with all the necessary regulations, but also provides the continued desired ROI over the entire life cycle of the plant.

Example delivery

Elomatic conducted a turnkey delivery of a new infusion solution factory for the Ministry of Health and Medical Industry of Turkmenistan in 2013. The demanding delivery included 400 m² of clean room spaces and extensive logistical coordination. The project was started in June 2012 and the factory started up without incident in July 2013.

Sterile Liquid Plants







The factory's capacity is 10 million infusion solution bottles a year, which is ample to meet Turkmenistan domestic demand.

Elomatic's scope included:

- Design
- Process equipment
- Laboratory equipment and furniture
- Clean utility equipment
- Clean rooms and clean room HVAC
- Piping and electrical installations
- Automation
- Commissioning, start-up and qualifications

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Related services

- Pharmaceuticals, p. 22
- Plant and Process Engineering, p. 96
- Validations Services, p. 111





Wheat Starch Technology

- for gluten, native and modified starches and by-products

Elomatic provides complete process technology and turnkey solutions for wheat starch processing industries all over the world. The projects are implemented on a turnkey basis.

The services cover the entire life cycle of the plant, from feasibility studies to basic and detailed engineering, commissioning and start-up all the way up to maintenance and modifications.

Elomatic's expertise in this field originates in the mid-1990s when it acquired the process technology from Raisio Group. Now we are able to place our more than 30 years' experience in wheat starch processing at our customers' disposal. Key features of the wheat processing technology

- Wheat processing into vital wheat gluten, native and modified starches and by-products
- Flour and water are mixed directly into slurry
- No delay before going into fractioning phase
- No time for gluten formation before the flour is fractioned
- Utilises almost all wheat qualities with a minimal water consumption and gives the highest possible gluten yield and quality

Related services

- Plant and Process Engineering, p. 96
- Starch and Potato Processing Industry, p. 18







Wheat Starch Technology

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Selected references

East Ocean Oils & Grains Industries, Zhangjiagang, China

Wheat starch plant with the capacity of 8 tonnes of wheat flour per hour into:

- Vital wheat gluten 0.9 t/h, ds 93%
- A-starch 6 t/h, ds 60%
- B-starch slurry 3.3 t/h, ds 32.7%
- Feed slurry ds 7%
- Engineering, equipment delivery, supervision of installation, start-up and training of personnel for the wet process and gluten dryer

AB Amilina, Lithuania

Wheat starch plant with the capacity of 20 tonnes of wheat flour per hour into:

■ Vital wheat gluten 2.24 t/h, ds 93%

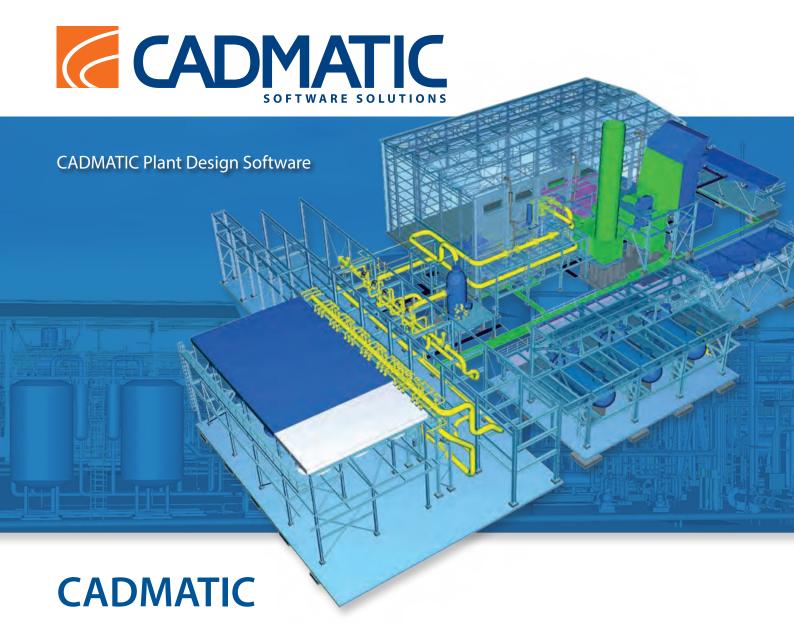
- Native wheat starch 12.7 t/h, ds 88%
- By-product 6.1 t/h, ds 88%
- Preliminary, basic and detail design, procurement, project management, equipment delivery for agglomeration and process automation and reporting system with Siemens PCS7, supervision of installation, start-up and training of personnel

Henan Lianhua Gourmet Powder Co. Ltd, China

- Wheat starch plant with the capacity of 16 tonnes of wheat flour per hour into
- Vital wheat gluten 1.9 t/h, ds 93%
- A-starch slurry 21 t/h, ds 39%
- B-starch slurry 7.6 t/h, ds 32.7%
- Engineering, equipment delivery, supervision of installation, start-up and training of personnel for the wet process and gluten dryer

4

Elomatic Products



- software solutions for engineering networks

CADMATIC offers solutions for Plant Design, Marine Design and Information Management. The solutions can be used in a wide range of industries and all types of engineering networks in globally distributed project environments.

CADMATIC information management products allow owners and operators to use project information beneficially throughout the investment's life cycle. The solutions are backed up with a full range of services: implementation, user and admin training, development of custom interfaces, maintenance and help-desk services.

CADMATIC Plant Design

CADMATIC's efficient and user-friendly plant design tools will help your design team to create complete and accurate 3D plant models and provide coherent information for construction.

The CADMATIC plant design solution is dedicated to 3D modelling of complete industrial projects, the creation of P&IDs (piping and instrumentation diagrams) and the generation of isometric drawings, as well as design review and data sharing in different formats.

- Diagram, P&IDs
- 3D model, layout
- Structural modeling
- Piping design
- HVAC and ducting
- Electric
- Laser scans
- Construction data
- Interfaces with other systems

For detailed information www.cadmatic.com/en/products/cadmatic-3d-plant-design





CADMATIC Marine Design

CADMATIC Marine Design provides a complete solution for the entire shipbuilding process, from initial design, preliminary design, basic design, and detailed design, up to ship production information and support during operation and maintenance.

CADMATIC Marine Design allows you to significantly save time during the production and engineering phases. It also reduces material costs during the production phase. The software is easy to learn and the fastest to implement on the market.

- Basic design
- Hull structural design
- Piping and outfitting design
- Production information
- Production documentation
- Integrated marine design and engineering
- Interfaces with other systems

For detailed information www.cadmatic.com/en/products/cadmatic-marine-design

Key benefits

Ease of use

Our solutions are exceptionally easy to use. The seamless user experience differentiates us clearly from our competitors. View our software demos to experience the difference CADMATIC can make.

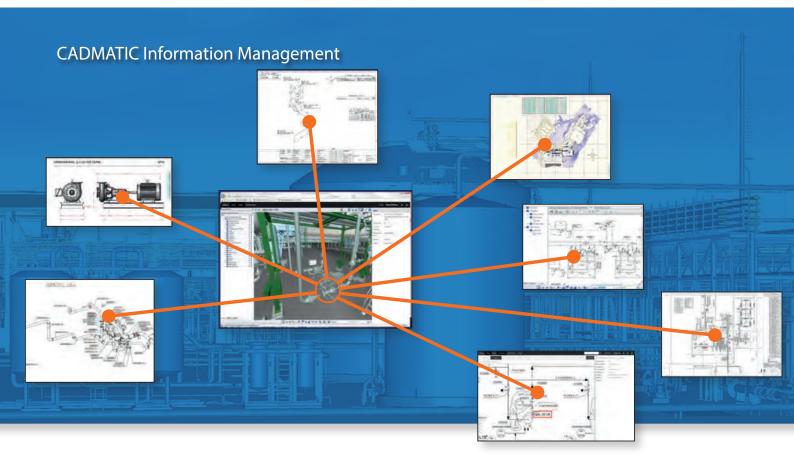
Distributed projects & interoperability

We focus on creating solutions that support work in digitally and globally distributed environments. Our products increase flexibility and provide you with complete freedom to select different software applications.

Impact on your business

Our products come with the promise to shorten the lead time of design, improve quality and accessibility and increase the efficiency of change management. See our references for CADMATIC success stories.





CADMATIC Information Management

The CADMATIC Information Management solution provides a single access point for all project-related information with an easy-to-use web-based interface.

CADMATIC eShare makes information available for all related business processes such as project management, procurement, production, construction, operations and maintenance. eShare provides real-time accurate information by accessing available project related databases. It improves communication and reduces information inaccuracy risks.

CADMATIC eBrowser is a project review tool that visualises the project in 3D without complex CAD tools. Users can share comments and check details about any object in the model.

CADMATIC eGo provides access to 3D model review on Windows tablets.

For detailed information about CADMATIC Information Management see www.cadmatic.com/en/products/information-management.

Key facts

- Provides information access to anybody, from any computer
- Two-way linking of models and documents
- Visualise categories with colour coding and hierarchies in the 3D model
- Add intelligence to models with smart points
- Add different types of info markers to your 3D model
- Add mark-ups to the 3D model
- Navigate between eShare and other applications
- Search for and access information quickly





Contact Information



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Caligo

patented flue gas treatment and process waste heat recovery system

We market and develop technical solutions for energy and process industry flue gas treatments and for recovering process waste heat.

With our extensive know-how in the field we are able to offer state-of-the-art technology and innovative product solutions. To develop our systems we draw on a combination of our high know-how in thermal dynamics and CFD and years' of experience in providing solutions for the practical demands of the energy and process industries. We offer our customers innovations and patented solutions with the shortest ROI periods possible.

Flue gas scrubber

The Caligo flue gas scrubber is dimensioned according to the target facility's nominal output, fuel used and the incoming temperature of flue gas and district heat water.

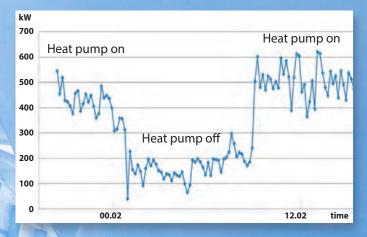
- Suitable for 3–20 MW plants (standard model)
- Independent automation system ensures process optimisation
- No changes to plant operation required
- No reliability problems or reduction in efficiency
- Fulfils the most stringent EU emission regulations
- CE marking for entire system
- Condensate enters drain network without need for purification
- ISO 9001:2008 certified

Caligo Clean Efficiency



Heat Recovery Efficiency measurina Laihian Nuuka-

measuring Laihian Nuukalämpö's heat recovery efficiency in the winter of 2012–2013.



Significant savings

The Caligo flue gas scrubber's heat recovery ability is based on our patented heat pump connector, which takes heat recovery to an entirely new level. The heat pump connector ensures that the maximum heat recovery is maintained even when the district heating incoming temperature is very high. A traditional flue gas scrubber's heat recovery would be very ineffective in this situation. The Caligo solution has no equals on the market:

- Unbeatable heat recovery: saves up to 35% of annual fuel cost
- Requires less than half the space of traditional solutions: savings in construction costs
- No external fresh water used

Fast delivery and installation

Our flue gas scrubber is a compact unit that is delivered on site ready to be used. At the installation site the unit is connected to the plant, after which it is operationally ready. We ensure the shortest possible delay from our customer's investment decision to the accrual of savings. With the help of our professional supervision services we ensure that our customers get the most benefit from their facilities throughout the year.

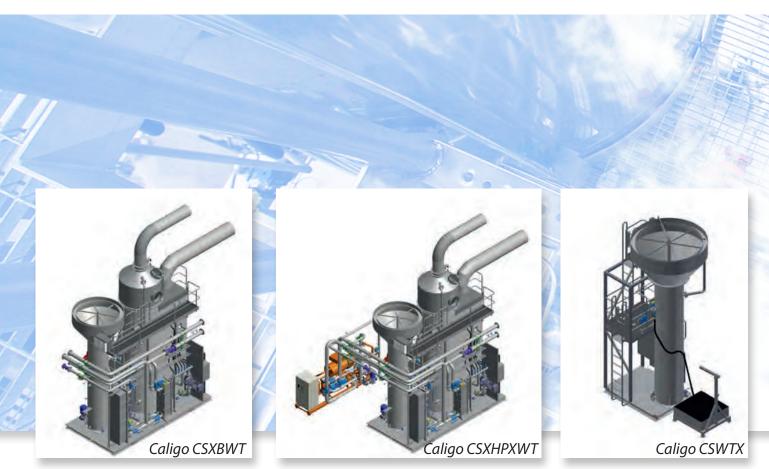
- Shortest delivery time on the market
- Quick installation
- Most running in is done at the factory
- Reliable and close support and advisory services

Related services

- Energy, p. 26
- Plant and Process Engineering, p. 96

Saves up to 35% of annual fuel cost!





Products

Caligo CSXBWT – Basic flue gas scrubber

This is our basic unit. It includes flue gas particle and SO₂ filtering, one heat recovery area as well as condensate and sludge handling.

Caligo CSXHPCWT – Flue gas scrubber with heat pump connector

This unit is recommended if the basic flue gas scrubber is sufficient for current needs, but the district heating return temperatures may rise in future, e.g. when more industrial customers are added to the network. The scrubber has space reserved for a second heat recovery area and heat pump connector (does not include heat pump).

Caligo CSXHPXWT – Flue gas scrubber with heat pump

The Caligo SXHPXWT model comes with a connected heat pump. The patented heat pump connector ensures maximum heat recovery even when return district heating temperatures are high. In such cases a basic scrubber's heat recovery crashes. This solution can save even over 35% of yearly fuel costs.

Caligo CSWTX - Condensate treatment unit

The condensate treatment unit can also be delivered as a separate unit. It handles condensate treatment, filtering and sludge separation completely independently. The treated condensate can be fed into the wastewater drain.

Caligo Clean Efficiency





Selected References

Elenia Lämpö Oy, Toijala, 2014

- 6 MW wood chip heating plant
- Caligo scrubber with heat pump CSXPHPXWT
- Average heat recovery: 28%

Adven Oy, Nummela, 2014

- 8 MW wood chip heating plant
- Caligo scrubber with heat pump CSXPHPXWT
- Average heat recovery: 32%

Kauhavan Kaukolämpö Oy, Kauhava, 2015

- 10 MW wood chip heating plant
- Caligo scrubber with heat pump CSXPHPXWT

VAPO Oy, Vilppula, Wood pellet factory, 2015

 Caligo water treatment unit with two condensate towers (CSWTX-TWIN)

VAPO Oy, Sotkamo, 2015

- 15 MW peat / wood chip heating plant
- Caligo scrubber with heat pump CSXPHPXWT
- Average heat recovery: 25%

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Alajärven Lämpö Oy, Alajärvi, 2016

- 8 MW heating plant (peat, wood chip, bark)
- Caligo Scrubber with a heat pump
- Average heat recovery: >35%

Kauhavan Kaukolämpö Oy, Kauhava, 2017

- 5 MW wood chip heating plant
- Basic scrubber, Caligo CSSX Piccolo (with storage containers and heat pump connectivity)
- Average heat recovery: >20% planned

Paimion lämpö Oy, Paimio, 2017

- 9 MW wood chip heating plant
- Caligo Scrubber with a heat pump

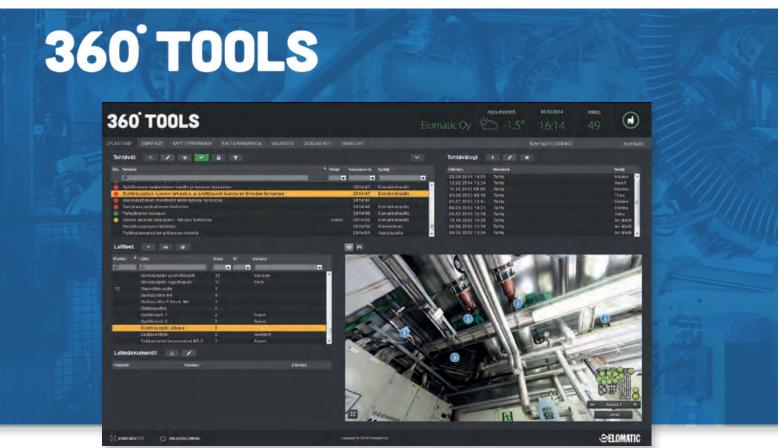
In production: Dalkia Group EDF, Tours, France

- 9.5 MW wood chip heating plant
- Caligo Scrubber with twin heat pumps

In production: Lempäälän lämpö Oy, Lempäälä

- 7.5 MW wood chip heating plant
- Caligo Scrubber with heat pump connectivity





360°tools – clear maintenance

360°tools is our in-house developed software family for maintenance and operation. The web-based 360°tools programs can be used anywhere and anytime. Our continuous product development is conducted in close cooperation with maintenance experts.

ePlant360° maintenance tool

ePlant360° is a maintenance and operations management tool. It is based on an innovation that links devices, maintenance and device documentation to panoramic images of a plant. The product pricing is based on the amount of panoramic images required and the maintenance cost is 20% of the implementation cost/year.

The ePlant360° can be set up quickly and cost-effectively and is delivered on a turnkey basis. Only three steps are required to get started: Photographing target, setting up system and software delivery and start-up.

Comprehensive ePlant360° solution

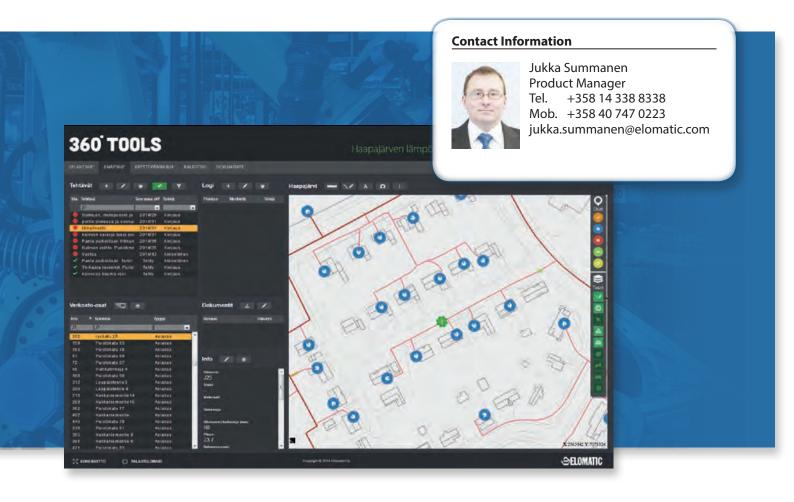
- Real-time maintenance program
- Unique document management system
- Clear spare parts management
- User diary for operational support
- Informative calendar
- User chat forum

Easy document and maintenance management

Documentation management in ePlant360° is extremely intuitive. The panoramic images of the plant are combined into a single interface and allow the user to move easily from one view to another. By clicking on information points in the picture, the device information and related documentation are displayed.



Information Management



The real-time maintenance program provides reminders for outstanding maintenance and repairs. Tasks are recorded as completed via the user interface, while related notes can be saved in the maintenance archives.

The user can easily add new maintenance and repair tasks to the system including maintenance timings, task descriptions and links to related panoramic images. Weekly or staff-specific reminders can also be printed out.

eMap360° network management tool

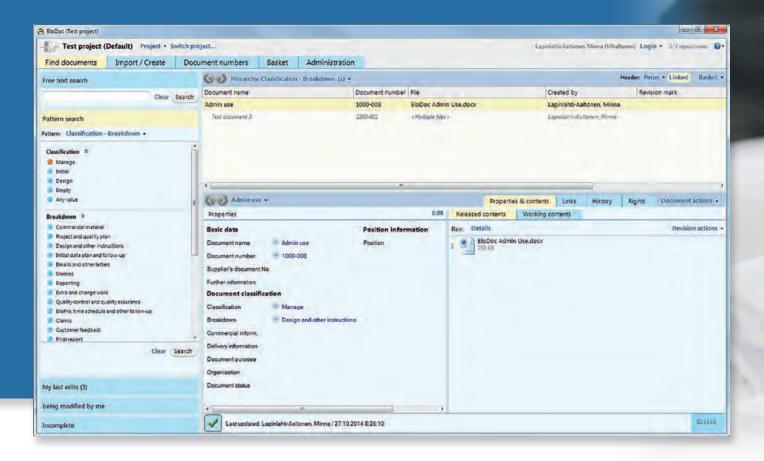
eMap360° is a network maintenance and management tool. It is based on a browser-based user interface where network parts, maintenance information and documentation are linked to a map view.

The product pricing is based on the length of the network and the maintenance cost is 25% of the implementation cost/year.

Comprehensive eMap360° solution

- Real-time maintenance program
- Clear spare parts management
- Informative calendar
- Geographic information system
- Efficient alarm system
- Unique document management systems
- User diary for operational support
- User chat forum
- Several map levels
- www.elomatic.com/360tools





Document Management – EloDoc

The comprehensive and versatile EloDoc document management system is the ideal tool to manage documentation throughout the entire plant or ship life cycle. The system was developed in-house by Elomatic and has a proven track record of managing the most demanding documentation requirements. EloDoc enables accurate control over all documents e.g. drawings, layouts, specifications, lists, validation protocols etc.

EloDoc is not limited to technical documentation, but is a very effective tool e.g. in contract management or in managing any other company documentation.

Benefits

- User identification and access control
- Document version management
- Document ID management
- Customisation of document metadata
- Extensive queries
- Mass transfer of documents to system from various data sources

Real-time access

Elomatic allows users to easily follow the progress of a project with direct real-time access to project documentation. This avoids unnecessary document deliveries and enables faster communication, commenting, approvals and optimises overall project progress.



Document classification

EloDoc facilitates document collection from different user perspectives. Queries allow explicit hierarchies to be generated and significantly ease finding a specific document. The queries can be created easily and these can be saved and used later.

Document safety and information security

Document safety and information security have received considerable attention in setting up the system. Keeping your data safe is our primary concern.

- Data traffic between the client and server is SSL encrypted
- Projects and documents are protected and use is based on user rights and user profiles

Linking to other systems

EloDoc can be interactively linked with other systems such as design systems and their viewers, maintenance and eBrowser systems; provided the linking is permitted by the system in question.

By integrating EloDoc with the powerful equipment and material database EloWise, and the 3D eBrowser, an excellent tool for storing and retrieving technical information relevant for operating a plant or ship is formed.

Contact us for a demonstration or to request more information.









EloWise

- MES Application Platform Solution

EloWise is a modular and integrated tool for a variety of MES and PLM applications. The EloWise solution combines production information management (documents), production execution management (functions and maintenance tasks) and production facility management (equipment and material data) in an all-in-one integrated system.

The technical information is easily updated and instantly available throughout the ship's or plant's life cycle for all relevant parties on board, on site and at the office. Maintenance tasks are planned and monitored, spare parts and storage are managed and relevant reports are generated. *EloWise* is also an excellent aid for communication and training. In order to maximise the added value of EloWise we customise the software to the particular needs of each application.

The EloWise modules complement each other to form an optimal application for each customer. The application is based on the EloWise database supported by the user interface base on which the required modules are installed.

Easy access to information

Searching for documents, user manuals, certificates and maintenance information can waste up to 30% of working time.

By integrating the *EloDoc* document management system, the 3D *eBrowser* and a powerful equipment and material database the EloWise solution provides an excellent tool for storing and retrieving technical information relevant for operating a ship or plant. When the information is kept up-to-date significant operational savings are gained. The interlinked information can easily be obtained by exploring the hierarchy structure, by searching the database, or by browsing the 3D model.



Information Management

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Reliable maintenance

The maintenance program is defined as function specifications in the EloWise database and maintenance tasks are automatically generated from the specifications. The timing of the tasks depends on the calendar or running hours of the automation system. Spare parts and other material information as well as storage data is defined and the stock status is kept up-to-date based on input of storage events.

Manuals and drawings needed for a particular maintenance task are directly available through references in the task card. EloWise keeps track of the maintenance task status and the overall situation is shown in a dashboard view. Relevant reports and statistics can be generated as required.

Selected references

The Finnish Border Guard

EloWise was selected by the Finnish Border Guard as the maintenance and technical data administration tool for the new offshore patrol vessel TURVA built by STX Finland in Rauma. The system was customised and the data structure was defined by Elomatic to fulfil the operator's requirements. The data entry was done in close cooperation between the operator, the yard and Elomatic.

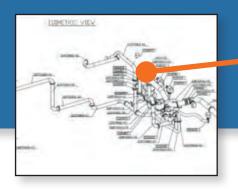
BASF Minerals Oy

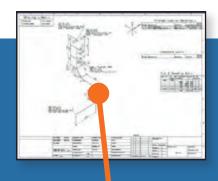
Basf Minerals selected EloWise for production planning and control in their factories in Rauma and Kotka, Finland.

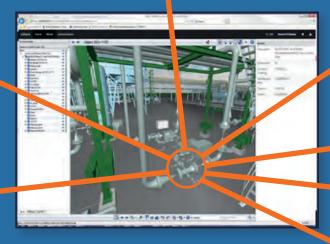












CADMATIC eShare

- information management and visualisation

CADMATIC eShare complements design and engineering solutions by providing an innovative and easy way to utilise project information and optimise business processes. It is allows organisations to combine, find, visualise and share project and asset information in a single and easily accessible web portal.

Independent solution

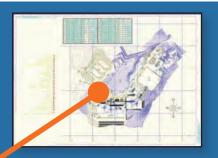
The eShare information management solution does not edit information but displays it as read from different sources. The product is completely independent of CADMATIC design software. Other system suppliers' 3D models can thus also be used as a base for the solution.

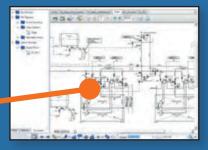
Combines information from specialised applications

People in different roles can use eShare to access information created with specialised applications for design and other business functions, without having to use each application separately. With eShare the user can take full advantage of the visual power of digital assets such as 3D models, P&IDs and other drawings.



Information Management





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Easy access to design information

eShare makes all design information easily available for other related business processes such as project management, procurement, production, construction, operations and maintenance – and vice versa. By integrating eShare with other business solutions processes can be significantly optimised. Current ways of performing activities can be substituted with more efficient working practices.

Key features

- Provides information access to anybody, from any computer
- Enables two-way linking of models and documents
- Visualises categories in colour and hierarchies in the 3D model
- Adds intelligence to models with smart points
- Adds different types of info markers to your 3D model
- Adds mark-ups to the 3D model
- Allows navigation between eShare and other applications
- Enables quick search and access to information





Oil Well Production Systems

We design, manufacture and build artificial lift solutions with proven operational track records in remote arctic and desert climates. The FloWQ™ product line is based on hydraulic jet pump technology. We offer products to tackle oil field production challenges, such as solid removal, paraffin and water treatment and disposal.

Wellquip production systems applications include surface and downhole equipment, well production optimisation software, remote monitoring, solid removal systems, chemical injection solutions and other equipment. Our production systems offer the best technology available for heavy oil recovery and for improving hydrocarbon production in areas of challenging well conditions that contain impurities such as sand, paraffin and asphaltenes in the produced fluid.

The FloWQ™ system is ideal for

Production modernisations

- Enhanced oil recovery
- Dewatering gas wells
- Well testing and early production
- Flow backs after fracture treatment and chemical treatment

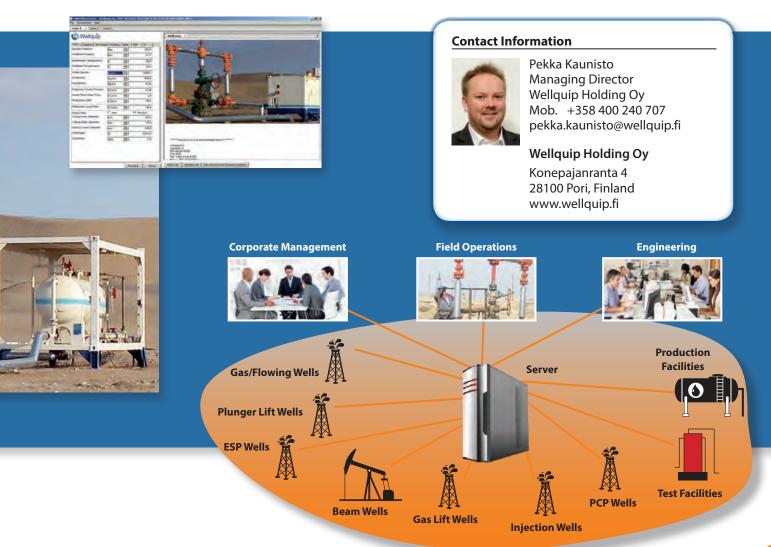
The integration of production systems, optimisation software and field service to new or mature fields enables higher rates of production with lower lifting costs and extended service life.

Main benefits of FloWQ™ jet pump

- No downhole moving pump parts, reduced maintenance and workover
- Optimised flow areas, suitable for offshore and onshore
- Production modes: annulus production, production up to tubing, tubing in tubing
- Suitable from slimhole applications to large diagram tubing
- In thru bore models all inner parts are retrievable: allows downhole maintenance without need for workover unit



Oil Well Production Systems



- Easy to maintain and durable. Reduced workover:
 - Carrier holding nozzle and mixing tube can be easily retrieved to optimise jet pump.
 - H₂S and CO₂ corrosive environments
- Offers downhole solutions for high deviated wells, high solids producers, high volume, bad casing, paraffin wells with possibility to use heating and chemical injection

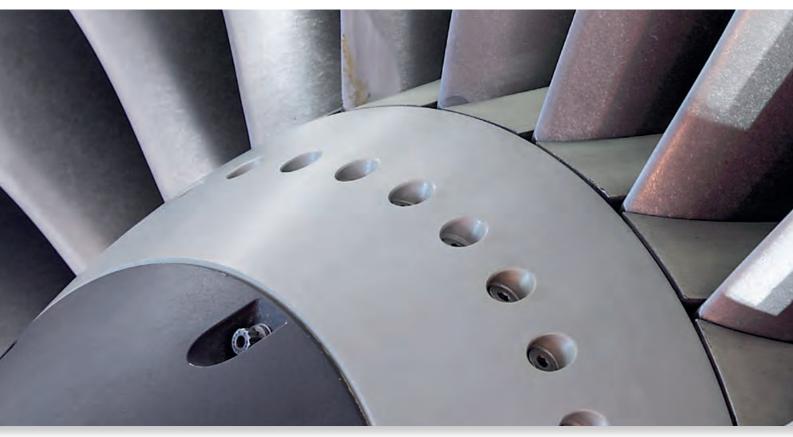
Engineering and support services

- Single-point field engineering
- From single-well design to full field development and product engineering
- Development and optimisation of existing production systems
- FloWQ[™] Well Simulation Software provides the operator with reports, technical support, control and analyses production data and optimises production.
- Field services: from basic support to building, maintaining and operating contracts.
- Localised, reliable and experienced construction

- and start-up services of Wellquip production systems from the remote arctic to desert climates.
- Maintenance and technical support includes equipment-based monitoring and an individual preventive maintenance plan that ensures cost efficiency, smooth operation and performance optimisation.
- Our condition-based maintenance reduces production interruptions to a bare minimum.
- We strive to achieve the lowest life cycle cost and highest possible efficiency and provide 24/7 support for field operations. Our solutions encompass every aspect of proactive service and customer support.
- All aspects of operation, maintenance and safety issues are covered in tailor-made courses.
- Field equipment, tools and spares
- We offer all oilfield equipment, tools or spare parts required for maintenance of existing systems or development of new features.
- Computational Fluid Dynamics (CFD), see Technical Analysis, p. 130

Elomatic Services





Aerospace and Lightweight Structures Engineering

Elomatic's aerospace engineers are able to provide comprehensive aerospace solutions from concept design all the way to production and implementation. Our knowledge spans the full range of disciplines required with particular competence in tooling and manufacturing systems, product engineering and comprehensive project deliveries.

We keep abreast of the latest technological innovations and are ready to apply them for the benefit of our customers. Our aerospace engineers are supported, among others, by our technical analysis experts, product, automation, production engineering and development as well as our mechanical engineering professionals.

Tooling and manufacturing process engineering

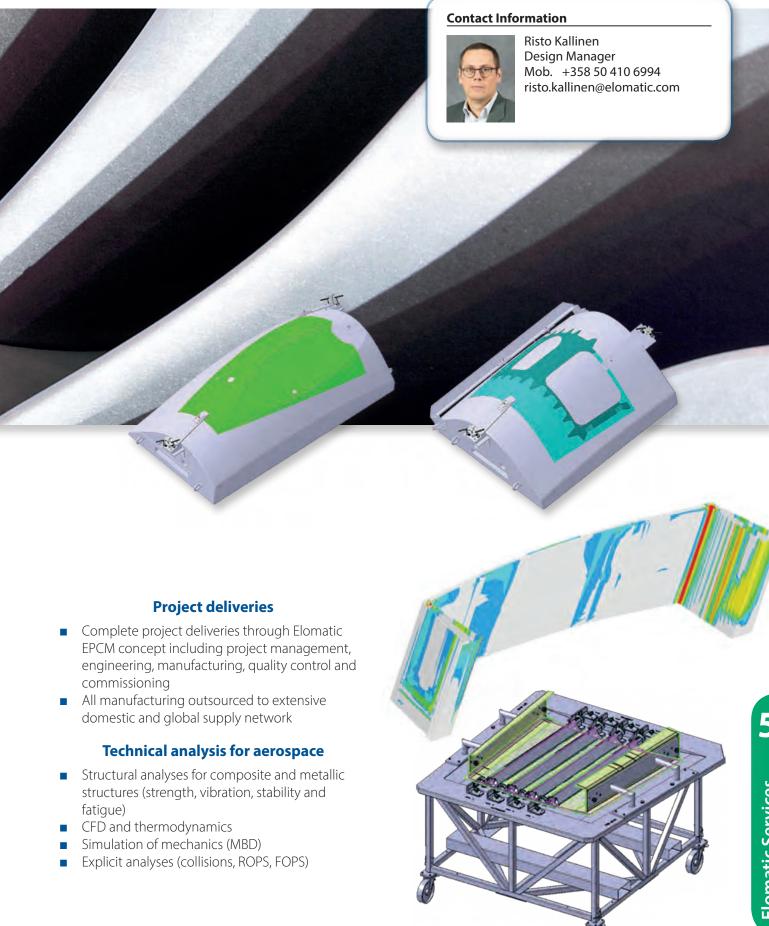
- Assembly jigs and fixtures
- Lay-up tools and moulds, both metallic and composite
- Drilling and routing jigs and fixtures
- Automated production cells
- Composite materials and manufacturing process consultation, simulation and development

Product engineering

- All areas of demanding mechanical engineering where low weight, high stiffness, corrosion resistance, fatigue life, or life cycle costs are crucial for the final product performance
- Co-located engineering team services
- Catia V5 CPD and Fibersim capability



Consulting & Engineering







Electrical, Instrumentation, Automation & IT

Elomatic's EIA & IT know-how covers all electrical, instrumentation and automation sectors. Expert IT know-how completes the package. Elomatic always offers its customers complete project services that, in addition to design, include a range of services from Elomatic's different knowledge centres.

Special expertise areas

- ATEX-classified areas
- Clean rooms
- Water systems
- Environmental monitoring systems
- Recipe-based batch processes
- Monitoring of product and production data and targets that require long-term archiving

- Systems that require validation
- Flexible production lines that are tightly connected to production control systems
- CHP plants
- Machine and device automation

Infrastructure services

Elomatic's infrastructure services comprehensively cover all industrial and plant electrification areas.

- Regional and plant electrical distribution
- Medium-voltage distribution substations
- Low-voltage distribution
- Area lighting
- Control room, alarm and security and telecommunications systems





Design tools

 Eplan Electric P8, Cads Planner, AutoCAD, Axes R4, E3, Dialux, Vertex ED, MagiCAD

Special expertise areas

- Energy auditor competence
- S1 electrical qualification

Technical analysis services

- Electrical network
- Electrical network selectivity analysis
- Heat tracing

Measurement services

- Profibus analysis
- Measuring circuit and control loop simulation
- Controller adjustments

Software applications

Elomatic software applications integrate seamlessly with production automation. Database applications are typical Elomatic application designs for automation system extensions.

- Data collection
- Reporting
- Analysis

Electrification

Elomatic offers working electrical engineering solutions. Our process, plant, mechanical, electrical, automation and information system know-how is found under the same roof and different disciplines work together seamlessly.

Process and building electricity

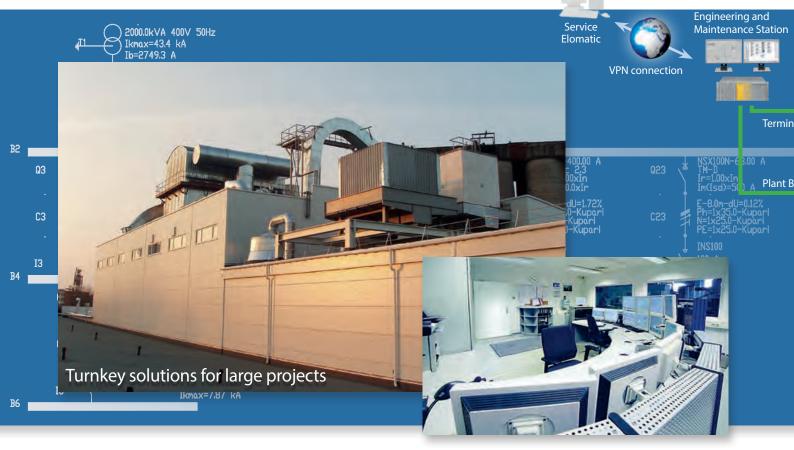
Elomatic's process and building electricity service package includes:

- Power and short circuit current calculations
- Main hub diagrams
- Circuit and wiring diagrams
- Cabling design
- Layout drawings (2D or 3D)
- Earthing and potential equalising
- Lighting, sockets, cabling
- Telecommunications systems
- Access control systems
- Camera and audio systems
- Burglar and fire alarm systems
- Emergency lighting, exit lighting
- Environmental monitoring systems



Elomatic has been ISO-9001 quality certified since 1991





Instrumentation areas

- Field equipment dimensioning and selection
- Automation systems
- Cabinets and casings
- Circuit wiring and cabling design
- Installation type drawings
- Equipment layout drawings
- Fieldbus design
- ATEX-classified areas

Electrical and instrumentation expertise areas

- Low-voltage distribution networks
- Motor and servo drives
- Frequency converters
- Buses
- Instrumentation
- HVAC electrification
- Electrical and automation cabinets
- Components, dimensioning and selection
- Space classifications
- Machine safety
- Machine vision

- Electrification of vehicles
- Complete design deliveries
- ATEX classifications
- Risk analysis and safety integrity specifications
- CE markings
- Marine electrical engineering

Automation

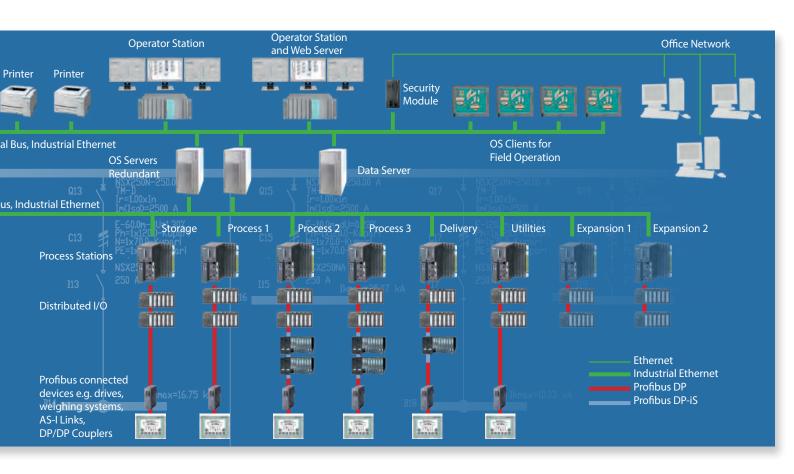
Elomatic has comprehensive know-how of different automation and SCADA technologies and systems. This is complemented by Elomatic's IT team, which has experience in data management and reporting systems development.

In automation system design and implementation we take a life cycle approach that allows economical production and easy maintenance.

- Design, installation, commissioning and maintenance services
- Services on a turnkey basis as part of the EPCM delivery service, or as a separate service product
- Cost-effective and high quality solutions
- Partnership throughout entire investment life cycle



Consulting & Engineering



Automation know-how areas

- Automation systems (DCS)
- Supervisory control and data acquisition software (SCADA)
- Programmable logic controllers (PLC)
- Data acquisition and reporting systems
- Batch software
- Data transfer between different systems
- Modernisation of old systems, application conversions and virtualisations
- Machine vision systems

Full compliance with different regulations

- Siemens Certified Solution Partner
- Wonderware System Integrator
- GAMP, 21CFR Part 11
- ATEX environment



Main benefits

Elomatic adheres to an integrated programming approach (ISA-88 and ISA-95) in its projects. Comprehensive documentation is also a natural part of service delivery.

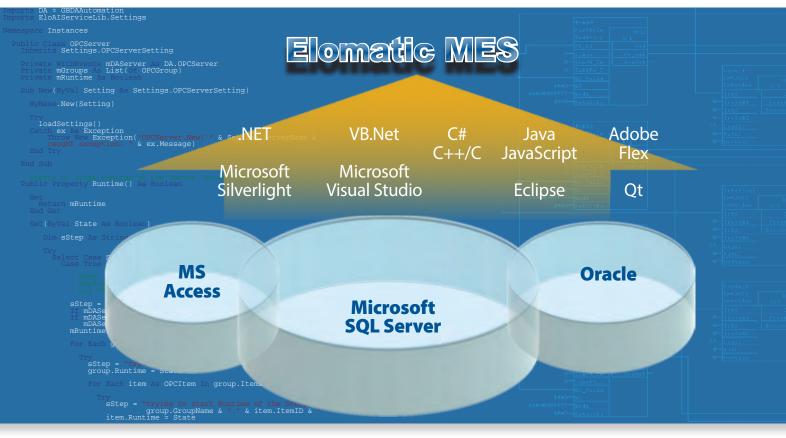
- Automated and error-free applications
- Short start-up time
- Eases system and application maintenance
- Acceptance tests (FAT and SAT)

User interface

The high utilisation rate of our customers' production lines is one of Elomatic's highest priorities. High quality usability design ensures optimal user interface safety, efficiency and comfort.

- Clarity, appearance
- Information amount according to needs
- Free space for user interface:
 - Control room
 - Process facilities
 - Floating user point operation (browser-based)
 - Mobile devices





Automation systems

Automation Systems

- Siemens PCS7
- Honeywell Alcont I, II, 3000x,
- TotalPlant
- Emerson Delta V
- MetsoDNA, PaperIQ

PLC Systems

 Siemens Simatic S5 and S7, Omron, Allen-Bradley, GE Fanuc, Beckhoff, Mitsubishi MELSEC, CodeSys IEC 61131-3, EPEC

Control room software

 InTouch, WinCC, WinCC Flexible, Proficy iFix, Citect, LabView

Bus technology

 Ethernet, Profibus DP and PA, ASi, ProfiNet, EtherCat, CanOpen, Can, Modbus, LAN

Elomatic IT

Elomatic has a high level of expertise and a long tradition of industrial production system design. Information system applications are related to production management, production tools management and production data management. These applications form a comprehensive MES-level package, ensuring accurate traceability, as well as efficient and flexible production management.

Elomatic application modules complement each other and create the most suitable package for the client's needs. The application platform comprises the EloWise database, automation user interface and user interface base to which the required modules are installed with ease. The user interface provides a base for data acquisition and processing. This can also be done visually via a 3D model and/or via panoramic images.

Elomatic MES

- Production management
- Production device management
- Production data management
- EloWise MES Application Platform Solution, p. 76



Consulting & Engineering



IT application services

We have thorough know-how in demanding software solutions, especially in the food, pharmaceutical and chemical industries. The applications seamlessly integrate with production automation, provide controllability and display important monitoring information in the control room, on the office wall, and on mobile devices.

- OPC WCF LINQ SQL LINQ to SQL XML/ XAML – ODBC
- Wonderware System Integrator
- Oracle Partner program member



IT infrastructure services

We have extensive experience in enterprise information infrastructure management and maintenance.

- Monitoring and maintenance
- System virtualisation
- User support and security services
- Procurement and asset management
- Citrix, VMware, Thin Clients, eWON

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Machine vision system solutions

We offer machine vision studies, product development and realisation services for R&D projects and can deliver machine vision equipment on a turnkey basis.

Machine vision products

- COGNEX InSight
- Omron Electronics
- LED light sources
- Control panels
- Data acquisition and reports for analysis

Special know-how areas

- Turnkey deliveries (EPC/EPCM)
- Development work
- Fieldbuses
- Testing devices
- Electrical and automation cabinets
- Components
- Data acquisition and reporting





Elomatic has a comprehensive range of engineering and technical consulting services in HVAC for industrial and public sector customers. Our wide experience in HVAC engineering includes demanding projects for pharmaceutical, food processing, chemical, mechanical and marine industry customers as well as for public and commercial premises and building sites.

Combining our know-how in HVAC with our understanding of the specific industry requirements enables us to provide services beyond standard engineering. Our HVAC engineering services are provided either as a stand-alone service or as a part of our engineering projects.

Special HVAC expertise

- Potentially explosive atmosphere areas (ATEX)
- Clean rooms and controlled areas
- Climate controlled areas
- Hospitals
- Public areas
- Pharmaceuticals, p. 22
- Process Industries, p. 14



Consulting & Engineering



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Marine HVAC design expertise

Elomatic has a long history of delivering demanding HVAC design services for all kinds of seagoing vessels. We are able to deliver a full design package that covers both basic and detailed design of all vessel areas.

- Technical spaces
- Public and accommodation areas
- Service areas
- Marine Design and Engineering, p. 42

Engineering scope

- Feasibility studies
- Basic design, detail design, site supervision
- Ventilation system design and dimensioning
- Heating and cooling system design and dimensioning
- In-house systems for district heating and cooling
- Plumbing design and dimensioning
- Building automation system design
- Cost estimates for building related systems
- Repair and maintenance need evaluations
- Energy reviews and analysis
- Troubleshooting services

Key design tools

- MagiCad
- CADMATIC 3D
- AutoCad







Mechanical Engineering

Over the years Elomatic's mechanical engineers have gained extensive experience in delivering a comprehensive range of technically demanding machine, device, product and production line services that include installation supervision where required. Our commissions range from the design of single machines or production line devices to the engineering of some of the world's largest industrial cranes and paper machines.





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Mechanical engineering expertise areas

- Machine engineering
- Tool engineering
- Equipment and component engineering, e.g. conveyors and carriers
- Frames and primary structures for industrial buildings
- Piping bridges, working platforms and stairwells
- Vessels, tanks, towers and pressure equipment
- Heavy steel structures (harbour cranes, shipyard cranes, offshore structures, port facilities)
- Consumer products
- **Vehicles**

Related services

- Electrical, Instrumentation, Automation & IT, p. 86
- Machinery and Equipment Manufacturing Industry, p. 32
- Product and Service Development, p. 114
- Production Engineering and Development, p. 98







EngineeringElomatic has a strong tradition of excellence

Elomatic has a strong tradition of excellence in diverse and demanding plant and process design projects across a comprehensive range of industry areas. Our core strength is our deep understanding of technical processes and their application areas.

We are able to put this extensive process know-how at our customers' disposal in all project phases from investment analysis with feasibility studies, to basic and detailed engineering, commissioning, and start-up through to maintenance and life cycle modifications. Our services in plant and process design vary from consulting assignments and single process equipment validations up to complete turnkey plants.

Plant engineering scope

- Structural design and construction engineering
- Layout engineering
- Piping engineering
- Equipment design
- Mechanical engineering and steel structures
- HVAC engineering
- Duct engineering (combustion air and flue gas)

Special plant engineering expertise areas

- Hygienic piping
- High pressure piping
- Clean rooms and controlled areas, ATEX
- ATEX, p. 112
- Pharmaceuticals, p. 22



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Process engineering scope

- Process descriptions, functional specifications
- Feasibility studies and cost estimates
- Mapping and selection of applicable technology/ unit operations
- Process simulations, energy and mass balances and dimensioning
- Material flow and capacity simulations in mixand-pack industry
- Equipment/unit operation dimensioning and material selections
- Process flow sheets and PI diagrams
- Utility requirements and systems
- Risk evaluations, Hazop analysis
- User instructions

Process engineering expertise areas

- Flammable and hazardous chemicals, ATEX environment. GMP
- Processes in pulp and paper, chemical, food, pharma industries, energy production and distribution
- Biomass processing including biofuels and pelletising
- Pressure vessel design
- Boiler design (water-tube boilers, fire-tube boilers)
- Energy, p. 26
- Health, Safety and Environment, p. 110
- Process Industries, p. 14
- Starch and Potato Processing Industry, p. 18





Production Engineering and Development

Elomatic offers extensive production engineering and development services whereby we identify and implement solutions for effective and economical production. Our goal is to identify our customers' production problems and to come up with effective solutions.

We are able to thoroughly analyse products, production, production control, manufacturing technologies, and factory layouts. This helps us to improve resource utilisation, increase efficiency, identify and eliminate bottlenecks and draw up plans for future growth and capacity. We use well-known Lean tools as well as our other production development competencies for this purpose.

Our main targets are new factory projects, existing production development, layout specifications and material handling systems. Our services include product development, electrical and automation solutions.

Production performance improvement

Elomatic can run a performance improvement project for your plant. The project describes how to meet manufacturing targets (especially lead time and on-time-delivery) and how to apply methods (such as Lean, Theory of Constraints etc.) and technology to your particular case in the best possible way.

The order-delivery process is analysed and improvement potential is identified. We focus in particular on improving manufacturing operations (production control, layout, lean methods, etc.). The project is carried out together with the customer's project team to ensure efficient change management from the beginning. A roadmap for longer term and short term project plans is created along with an investment schedule. Tools such as value stream mapping and production simulation are used during this interactive process. Elomatic can provide support during the implementation and engineering tasks as well.



Production equipment engineering

We are able to engineer special production machines and tools for various manufacturing tasks. This includes equipment such as welding jigs, assembly fixtures, lifting devices and test benches. The automation level and size of the engineered equipment vary depending of the customer's need.

Production simulations

Elomatic offers production simulation services that produce information and solutions for production development or analysis. Production simulation can be used to verify the performance and operation of a new factory, line or cell concept. It shows the areas that might need improvement and how a defined system works under dynamic job flow e.g. inventory levels and utilisation rates.

Simulation is a cost effective way to prevent costly errors in incorrectly designed production systems and an excellent troubleshooting tool for existing production environments where the complexity of the operational dynamics makes problem areas difficult to pinpoint. Visual simulation (3D) is effective when the idea needs to be presented to a wider audience e.g. for training and investment proposal process.

Production development benefits

Reduces production costs

Production control methods

Production simulation

Time studies

- Increases throughput and productivity
- Reduces lead times and WIP
- Improves delivery promptness
- Assists planning for future growth and capacity

HSE (Health, Safety and the Environment)

Elomatic offers comprehensive safety consulting in every phase of the production engineering project. This includes engineering and purchase of new production lines and machines as well as modernisation of old equipment. We consider machine safety regulations and safety norms such as ATEX, Ex and pressure vessels.

We evaluate safety requirements, conduct risk assessments and complete CE-marking processes. Our support consists also of HSE training and documentation.

- Electrical, Instrumentation, Automation & IT, p. 86
- Health, Safety and Environment, p. 110
- Machine Safety and CE Marking, p. 111
- Machinery and Equipment Manufacturing Industry, p. 32
- Product and Service Development, p. 114





Selected References

Product test bench

- Transmission test bench for multi-megawatt power
- Extensive measurement data
- EPCM delivery, low cost and fast delivery
- Dynamic hydraulic loading systems

How it was done

- Completion of concept design
- Structural analysis
- Detail design of parts
- Electric and automation engineering
- → Enabled implementation of multi-megawatt test bench; unique solution, first in the world

New factory concept

- 9 different factory layout options created and one selected
- Technology selected
- Animation created

How it was done

- Brain storming the ideal layout options
- Analyse and design layout options
- Define the technology
- Select the layout and technology
- Create an animation and presentation
- → Present the investment plan to the group board; investment made



Consulting & Engineering



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Assembly cell

- Cycle time reduced from 14.3 to 7.2 min/unit
- 50% reduction in production man-hours
- Capacity increased from 42 to 66 units/d
- Utilisation degree improved from 53% to 82%

How it was done

- Analysis of current situation; define future targets
- Development of new production methods based on current state and future targets
- Design the new factory layout according to the MOST* results
- Design the lifting accessories for front axis
- Design the machine vision supported automatic screwing machine for axis
- → Cell operational 4.5 months after project start

Production control concept

Goal: short lead time with simple control mechanism

- Procurement and material management
- Visual management: control board and layout
- Training and start of piloting

On time delivery and lead time

- OTD improved from 60% ca. to 90% ca.
- Lead time reduced by up to 5 weeks
- Improved understanding of how process behaves
- Implementation of simple control principles

How it was done

- Analysed current situation, value stream map
- Training of applicable Lean methods
- Design of new production control principle
- Gates, sales balancing, CONWIP
- Use of ERP and needed changes
- To-be value stream map, implementation plan
- → Rapid solution implemented for acute problem





FORMIOT Data Analysis Services

Measurement data collection, data analysis and the processing of data into user friendly formats have become crucial elements in achieving operational efficiency, cost savings and competitive advantages. Elomatic offers expert data-analysis services geared at boosting your business and operational efficiency.

All data is not equal. Elomatic's FORMIOT data analysis service helps you identify the factors that can actually improve cost efficiency and develop your business. We are thoroughly familiar with our customers' processes and are, therefore, able to offer detailed solutions to meet their production and operational needs.

FORMIOT data-analysis service

- Data acquisition service
- Data analysis, reporting and visualisation
- Cooperation agreements
- Expert and implementation services
- Training

Benefits

- Continuous monitoring of operations
- Faster problem solving
- Decision making based on real-time facts
- Predict measures required
- Gain competitive advantages

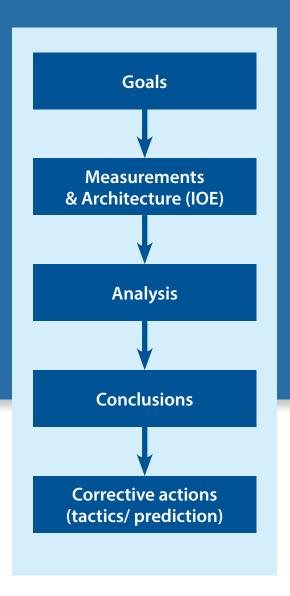
Developing data collection and processing data into information

The data analysis process consists of three phases:

- 1. Measurement and monitoring development (planning),
- 2. Data collection development and system infrastructure and
- 3. Data processing and analysis.

In the *measurement and monitoring development phase*, we gain an understanding of what data is already available, how reliable is it, and what kind of measurement data would be useful for analysis.

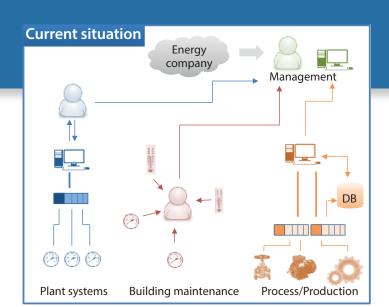




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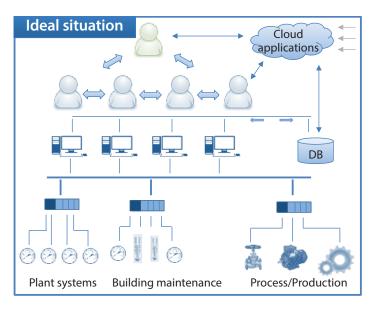
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In the data collection development and system infrastructure phase, the systems and databases that host data are selected.

In the data processing and analysis phase essential information from the large data mass is summarised and processed into usable formats.

Contact us for more detailed information about how our data analysis services can boost your company's operations.







Energy Audit Services

Energy audits aim to lower energy and water consumption, related costs and CO₂ emissions. Energy audits clarify the target facility's whole energy consumption, energy potential and derived profitability.

The Finnish Ministry of Employment and the Economy subsidises energy audits that have been conducted according to the Motiva model. The subsidy covers a maximum of 40–60% of the energy audit costs. Clear benefits can be derived from energy audits.

- Cost savings; also without investments
- Improvements in instrument monitoring and energy efficiency
- Basic information about device condition and performance
- Reduction in CO₂ emissions

Expert audit services

Elomatic's expert auditors conduct energy audits according to the Motiva model for industry, communes and real estate. The audits are conducted by Motiva trained and qualified auditors that have diverse experience of energy projects.

Elomatic implements the audit phases from measurements to reports according to the customer's needs. The close cooperation continues throughout the entire life cycle of realisation projects. The customer has Elomatic's entire range of expertise and experience at its disposal.

"Over 50% of suggested savings measures produced by audits have a payback period of less than two years"

Motiva



Consulting & Engineering

Audit

- Collection of initial data
- Fieldwork: measurements and interviews
- Analysis of current water and energy consumption



Results of Energy Audit

- Current water and energy consumption and distribution
- Technical information and use of devices
- Savings calculations and suggested actions
- Report



Implementation of Actions and Monitoring of Energy Use



Savings and Improvements in Energy Efficiency

Energy audit models

Industrial energy audits focus on the potential of production processes and real estate to reduce energy and water consumption.

Renewable energy municipal audits clarify the renewable energy production potential of the communal area and the financial viability of increasing local energy production.

In district heating energy audits and power plant energy analyses the possibility of increasing efficiency of energy production, transfer and distribution is investigated. The goal is to improve cost efficiency.

Building energy audits focus on identifying possible savings in real estate HVAC and electrical devices and their methods of use.

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Suggested savings measures

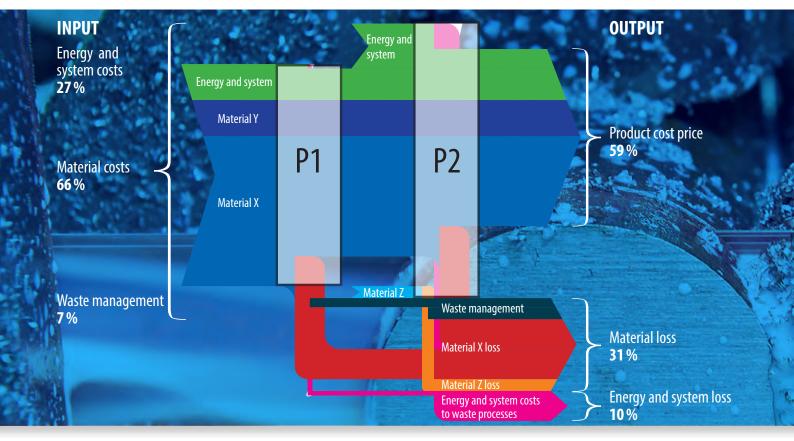
The audits result in suggested measures that are accompanied by clear calculations of the cost savings that can be achieved. The calculations for the suggested savings measures can be directly used for investment decision making and for compiling subsidy applications.

Typically suggested measures

- Making use of lost heat in process water and exhaust air with the help of a heat pump
- Improving maintenance and efficiency of heat recovery devices
- Changing operation times of air ventilation and lighting
- Correcting compressed air network leaks
- Replacing oil with renewable energy







Material Audits

- increase your profits

Material audits achieve real and significant savings and do not require large investments. In fact relatively small investments can reduce costs markedly. The potential savings gained from material efficiency are far greater than labour costs and energy costs combined! Our material efficiency experts are ready to assist your organisation to take your profitability to a new level.

Benefits

- Get a clear picture of material flows
- Focus on waste materials
- Allocate costs to waste
- Reduce waste
- Reduce costs quickly
- Benefit from tacit knowledge in your organisation
- Same output from reduced material inputs
- Improved profitability

Large savings can be achieved through procedural developments or minor layout improvements



Consulting & Engineering



Elomatic's material efficiency know-how

- Motiva-trained material auditors
- Deep process engineering domain knowledge
- Diverse know-how to design savings measures and manage projects
 - Process and plant design
 - R&D services
 - Technical analysis to optimise structures
 - 3D and 2D design tools
 - Materials knowledge
 - Production optimisation

How long will the audit take?

The auditing process can last from a few months to half a year, depending on the target enterprise's size and area of operation, as well as the level of initial data and available resources for the job. The consultant's work on the audit usually requires approximately 2–3 months.

How do I get started?

Contact Elomatic to get an expert opinion about how and over what period a material audit can be implemented in your organisation. In Finland we adhere to the systematic Motiva model which has been designed to achieve the best results.

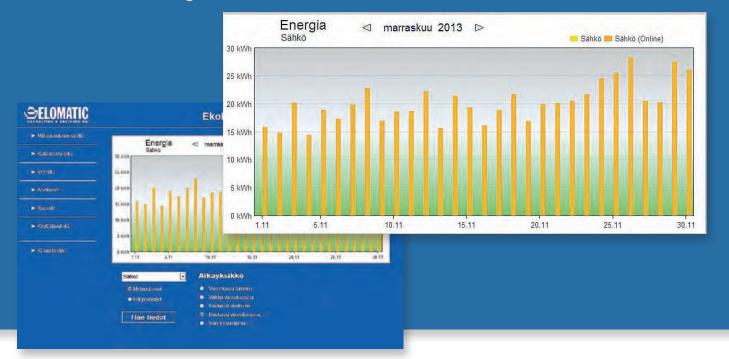
Facts about material audits in Finland *

- Audit produces 40–100 concrete savings measures on average
- Medium-sized enterprises annual savings potential 300,000–1,000,000 euros
- 20–50% savings realised during first year
- Savings potential of single material flow as much as 30%

* Source Motiva



Real-time consumption information at your disposal to ease decision making



Consumption Management Tools

- ESC products

Elomatic's ESC products have been designed to measure and monitor consumption flows. The products measure and/or collect realtime information from different consumption sources. The information is output for comparison and can be used in decision making.

Up to date and easy-to-use information eases decision process significantly. This allows more efficient use of resources and reduces waste and energy flows. The benefits accrued are not only financial, but also add value to our customers' green corporate images.

Measurement targets

- Food waste flows
- Material flows
- Energy consumption
- Water consumption
- Travelling





Consulting & Engineering



ESCdata – consumption information data acquisition system

ESCdata is a browser-based data acquisition system for monitoring measurement data from different consumption sources. The system can, among others, monitor food waste, energy consumption, water consumption and consumption related to travelling. The measurement data can be displayed graphically on web pages or on Excel spreadsheets. The data can be used to affect consumers' consumption behaviour or for operations control (the system can be connected directly to the customer's operations control system).

- Measurement data can be altered to reflect the related carbon footprint which allows direct comparison of different consumption targets
- Environmentally friendly company image
- Reduction in costs through better consumption management
- Efficient data acquisition
- Can easily be extended
- Data can be used in environmental reporting

ESCflow - material flow monitoring system

The **ESCFlow** device monitors food waste flows in realtime. The measurement data can be used to take corrective action to reduce food waste.

The ESCflow system displays the food waste in real time and can also collect consumer feedback at the same time. The measurements can be checked with the ESCdata data acquisition system and consumer feedback displayed on a web page. The information gathered can e.g. be used in designing menus to reduce food waste.

- Saves money via reduced consumption
- Time savings
- Green company image
- Automated waste management
- Reduces waste
- Reduces harmful effects to the environment
- Easily transformed to monitor other consumption and/or material flows or for consumer surveys





Health, Safety and Environment

Elomatic HSE Services are an integral part of our design services. We provide a large service concept starting from the first design phases. Choices made in the design phase either promote or demote the safety of industrial plants.

Today, companies face an ever growing jungle of directives, rules and regulations that need to be adhered to. With our vast knowledge of regulatory requirements and design standards, Elomatic is able to deliver a safe and functional (industrial) environment, which fulfils regulatory and customer requirements.

We provide our customers added value by offering our in-house CFD and structural analysis services when needed. We also produce separate safety products, such as explosion safety documents, rescue plans, safety surveys, etc.

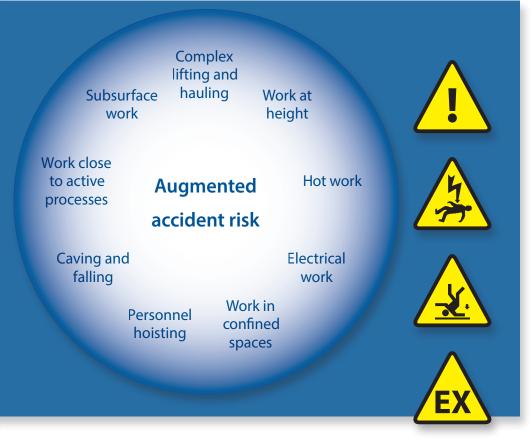
Elomatic assists customers to ensure that their employees always leave work happy and in perfect health.











Consulting & Engineering

Occupational safety

Elomatic's services related to occupational safety include fire protection and building safety, construction site HSE services (management/control), rescue plans, and occupational safety surveys. This field of expertise includes ergonomics and usability. We also provide training related to all the service areas.

- Fire safety & rescue
- Work environments
- Chemical safety & surveys

Benefits

- Fulfilling regulatory requirements
- Optimisation of land and plant size, thus reducing costs
- A safe working environment for employees, equipment, and the environment
- Use of up-to-date information
- Reduction of production interruption times (better plant availability)

Machine safety and CE marking

Elomatic offers machine safety consulting and CE marking services in all phases of customer projects. Our experts have extensive experience in applying the directives and ensuring compliance.

CE marking services

- Assessing the conformity of machinery
- Changes to old machines
- Machine directive and CE marking training
- Documentation

Benefits

- Know-how of impartial expert
- Latest directives are in use
- Process is ready for use
- Reduce use of own resources





Risk analyses

Elomatic's services related to risk analyses include facilitating risk analyses, performing analyses according to different methods, and consulting.

Risk analysis services

- Potential problem analysis
- HAZSCAN/HAZOP
- FME(C)A
- Fault tree analysis
- Analysis of risks in the workplace, work methods

Benefits

- You know and understand the hazards and risks of your operations
- Legislative requirements are fulfilled
- Cost reduction by preventing accidents and sick leave
- Identification of improvement possibilities

ATEX

Ensuring the safety of employees is imperative and should be every business' no. 1 priority. Let our experts help you to achieve this in the most efficient and trouble-free way.

ATEX services

- Explosion safety documents
- Explosion pressure calculations
- Equipment-specific risk analyses
- Zone classifications
- Equipment conformity assessments
- Pressure relief calculations
- Methods for minimising ignitions of explosive atmospheres (e.g. by inertion)
- Methods for minimising the effects of a possible explosion

Benefits

- Access to the latest legal regulations and standards
- Documentation and plant design that fulfils authority requirements
- Optimisation of plant layout

Contact Information



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Pressure Equipment
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Pressure equipment

Are you a plant owner or are you responsible for the pressure equipment in your plant? Elomatic's pressure equipment services are designed to help in every step starting from the first specifications and ending with maintenance.

Pressure equipment services

- Specifications for pressure equipment
- Layout and construction plans
- Strength calculations and dimensioning including supports and accessories
- Advanced calculations for pressure equipment, thermal power stations, etc.
- Safety automation
- Combinations of pressure equipment and hazardous chemicals
- Maintenance plans
- Conformity assessments of equipment



Validation services

Our validation services are designed to reduce costs and avoid time schedule delays. We diminish quality issues and surprises at later stages of your investment project with our proactive, systematic and pragmatic approach.

Validation (qualification)

- DQ (Design Qualification)
- IQ (Installation Qualification)
- OQ (Operational Qualification)
- PQ (Performance Qualification)
- PV (Process Validation)

Commissioning

- DR (Design Review)
- FAT (Factory Acceptance Test)
- SAT (Site Acceptance Test)
- Pharmaceuticals, p. 22





Product and Service Development

Elomatic offers services for product and service development from customer ideas all the way to production and commercialisation.

We create solutions for different industries, consumer products and digital service applications.

The experts providing the solutions are mechanical engineers, plastic and device designers, production experts, innovation experts, concept designers, strategic designers, industrial designers, graphic designers, programmers, animators, application developers and usability experts.

Key to our approach is teamwork and our experts' commitment to solve our customers' diverse problems and fulfil their expectations.

Tailor-made service delivery

Elomatic's product and service development operations are supported by strategic services, innovation services, research services and productisation services.

Customer-driven solutions

The starting point for all our product and service development solutions is a profound understanding of our customers' needs, requirements and related operational challenges.

In addition we take care to understand how our customers' products and services add value for the end customers and focus our energies on providing solutions that maximise this added value throughout the entire product and service value network.





Product and service design

We strive to be involved from the earliest idea generation phases all the way up to commercialisation. A key strength is the ability of our team comprehensively cover different development needs.

Product design expertise is the cornerstone of our product and service development offering. We are fully familiar with the technical design challenges faced in industrial plants, machinery and electronic consumer products.

Key product design know-how areas

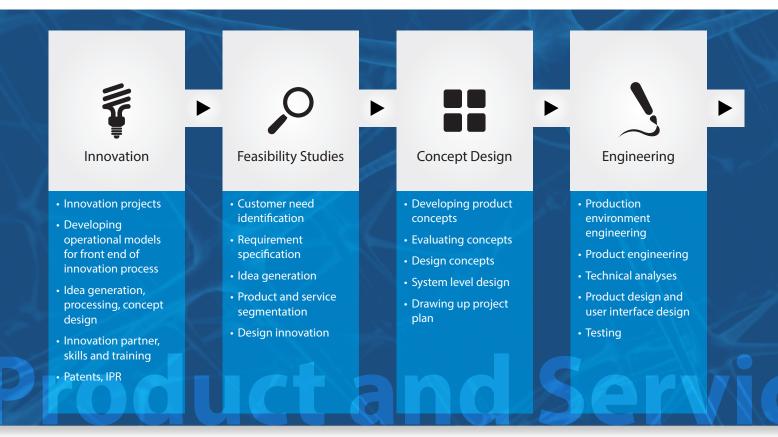
- Advanced mechanical design
- Electronic device design
- Machine design
- Metal design
- Sheet metal design
- Tool design
- Design project management

We often approach products from a service provider's perspective. We process products into services when they require management, guidance, maintenance and marketing. Our services are used optimally when we can provide fully comprehensive solutions to all the challenges associated with products and their related services.

The design of concrete products and services is complemented by our orientation to the front end of development processes, where we are involved in research, innovation and conceptualisation of the key integral features that ensure success on the market.

We understand our customers and the entire product and service value network. We deliver diverse solutions for business challenges.





Integrated approach

We focus on integrated development activities, i.e. the concurrent and controlled completion of different project phases and know-how areas. The implementation of an integrated development model is a key factor in ensuring that an idea can be processed efficiently into a realised product or service while risks and costs are minimised.

Integrated development projects involve experts from diverse know-how fields including product development, strategic design, innovation, research, conceptualisation, marketing, service design, production engineering all the way up to product and service commercialisation.

Innovation services

We create innovations and manage innovation projects systematically with effective tools. We identify possibilities and new ideas and effectively support our customers' product and service development projects and business strategy development.

By focusing our efforts in the front end of innovation projects we ensure delivery of practical improvements.

Strategic services

We look at business operations as large and comprehensive entities. Our strategic design services generally focus on providing solutions for critical operational success factors so that they can be implemented in a controlled, long-term and efficient manner. Our strategic services are often aimed at products, technologies, innovations and design assignments.

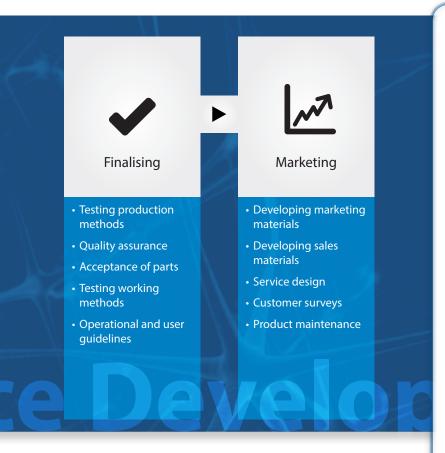
Strategic questions need addressing when searching for the correct path in the early phases of development and innovation processes. Via our strategic and innovation services we can also create prerequisites for identifying new products, services and markets.

Research services

Our research services support product and service development processes and related services. They are divided into two main branches: user-centred research and technology research.

User-centred research provides an understanding of the end user's world and his/her identified and unconscious needs. This information about good usability, ergonomics and design gained from user experience can be transferred to the product or service.





Technology research is conducted to improve our understanding and increase know-how of phenomena, which enables us to analyse and optimise the functionality and performance of products and production processes.

Productisation services

If you have an idea, we can help make it a reality! We offer services to transform ideas into concrete products or services. We start from initial surveys that define the targets and operational environment and reflect the ideas and goals.

Our experts are ready to partner our customers in resolving the questions above. We have the skills and know-how required to assist you in productising your ideas, products and services.

Diverse expertise providing solutions for individual needs

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Supporting services

User Experience, p. 118

Innovation Services, p. 120

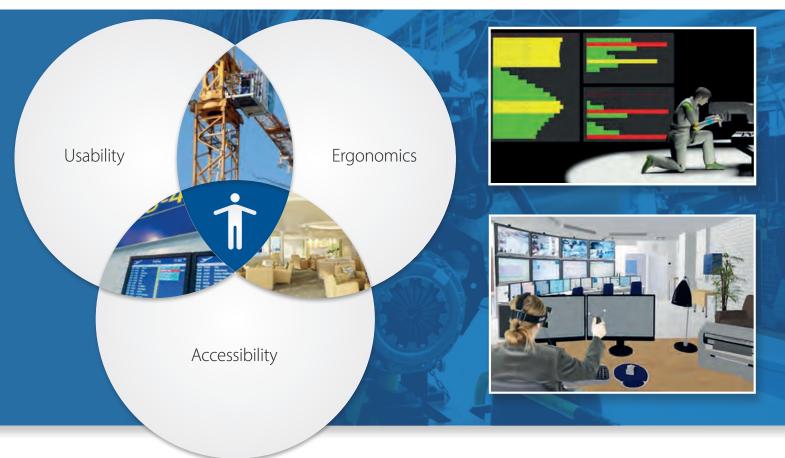
🔁 Industrial Design, p. 122

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User Experience

Usability - Ergonomics - Accessibility

Elomatic's experts apply knowledge and information of human factors to optimise design solutions. They are able to discover and apply information about human behaviour, abilities, limitations and other characteristics that result in optimal design that is productive, safe, comfortable and effective to use and create a positive user experience.

Usability

In development work related usability, we match product features to the product users' information management capabilities – functioning of the senses, observation capabilities, action-related thought processes and information management mechanisms. This results in products that are easier to use. The user can detect and understand the information and act correctly.

Ergonomics

To improve ergonomics we adjust the product or environment to match the user's physical features such as anthropometric dimensions and their variations, permitted loads, performance levels and functional limitations. The correct dimensioning and adequate work task design result in optimal work postures and power generation, good visibility and effective operation.

Accessibility

For targets to be directed at all users – including those with disabilities – accessibility must be taken into consideration. Good knowledge of human behaviour, various standards, laws and regulations is essential. Adequate accessibility design creates an operational environment that allows different users to achieve their goals regardless what limitations they may have in their abilities or senses.





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Application areas

- Public spaces and meeting rooms
- Plant and factory spaces, production lines
- Control rooms
- Work spaces and workstations
- Vehicles
- Cabins
- Machines, devices and tools
- Mobile devices
- Software and web applications

Our services

Evaluation and development of operational environments and products

- Expert evaluations and usability testing
- Modifications, new designs, product development
- User surveys and interviews
- Observation studies and work studies
- Eye-tracking studies
- Light, noise, and vibration measurements etc.
- Fit mapping
- 3D ergonomics simulations
- Testing and 3D audits in a virtual environment
- Accessibility surveys

Training

Training for designers and product developers offers information about users and user-centred product development including design instructions. The topics are usability, ergonomics and accessibility.

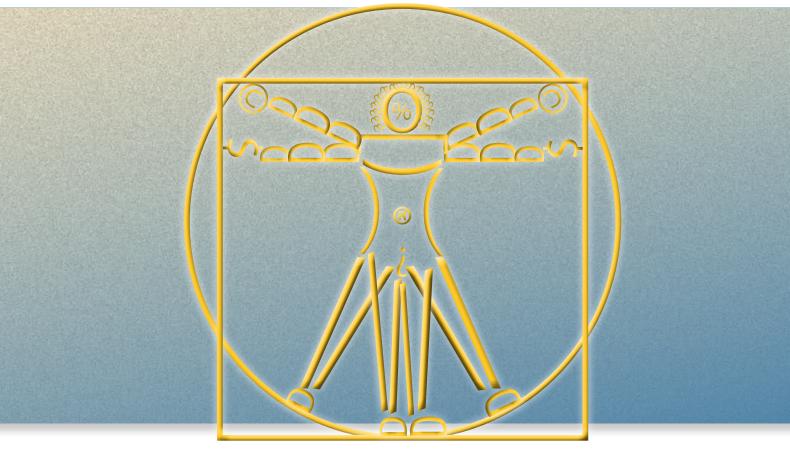
Development consulting

Need identification and project planning

Benefits

- Increased safety, user productivity and operational efficiency
- Reduced physical and mental stresses/loads
- Improved user experience and system performance
- Reduced need for training and support
- More efficient and desirable development process
- User feedback at sufficiently early phase
 - Design solutions based on correct information
- Eases comparison of development alternatives and solution selection
- Reduction in extra costs and delays
- Optimal and productive means involve real users in design and development projects
- Sustainable development and reduction in product liability risks





Innovation Services

Elomatic provides innovation services to its customers that assist them in implementing innovation projects with the help of systematic innovation processes and effective tools. Innovation projects generally include four phases: the front end of innovation (FEI), research and development, production development and commercialisation. Efficient management of FEI is crucial in achieving successful innovation projects.

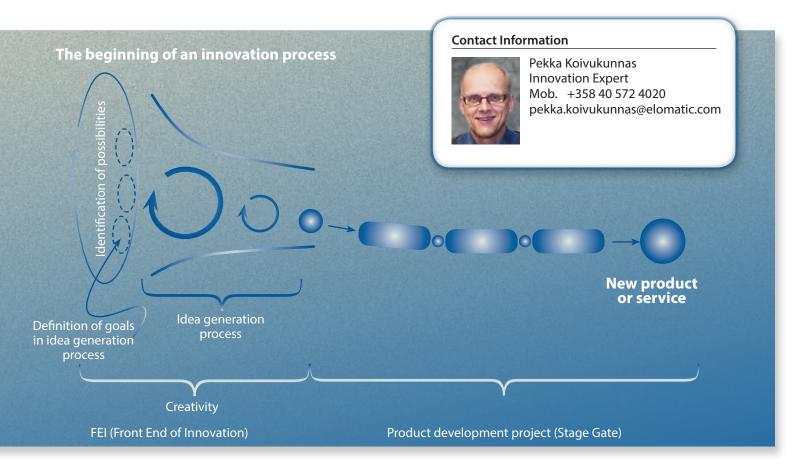
The front end of an innovation process includes, among others, identification of customer needs, specification of idea generation challenges, idea handling and processing, idea evaluation and selection, concept development, protection of innovations and R&D project idea development.

Our goal is to create the best possible basis for product development, which is the following step in the innovation process.

Systematic innovation process

A systematic innovation process ensures that all possibilities are identified, all perspectives are taken into consideration and that all ideas are handled appropriately.

Successful organisations invest more resources into the front end of innovation processes, gather more ideas outside of the organisation and have created effective operational models to cope with the glut of ideas that are generated.



Services

We assist our customers with successful implementation at the front end of innovation projects in the following ways.

- Innovation projects
- Development of operational models for FEI (systematic innovation process)
- Idea generation services
- Idea processing and concept development
- Innovation partnering
- Securing intellectual property rights
- Innovation skills
- Innovation training

Idea generation

The core of any systematic innovation process is idea generation, which is a continuous and systematic process that produces and processes new ideas. The use of a systematic idea generation process and the correct tools results in ideas that are most likely to lead to innovation.

We assist our customers in idea generation in the following ways.

- Problem definition
- Solving technical problems
- Idea generation sessions
- Idea generation services
- Survey of existing solutions
- Idea evaluation
- Idea generation training





Industrial Design

Our industrial designers have a profound understanding of our customers' needs and operations and are able to provide in-depth answers to their strategic and operative needs. We create solutions for different industries, consumer products and electronic service applications.

Elomatic's industrial design experts are actively involved in our product and service development projects to ensure that the developed products and services are success stories for our customers.

Practical and strategic industrial design

Practical industrial design offers positive user experiences, pleasing and attractive aesthetics, innovative solutions, cost-effectiveness and visionary design style. Strategic industrial design focuses on long-term business development and offers solutions for design strategies, corporate image and design management.

Industrial design's strengths are based on innovative cooperation with multi-domain experts. This is especially important in the creative phases, and at the beginning of product or service development.

Industrial design solutions

- User and customer research and customer insight
- Product and service target group segmentation
- Industrial design innovations and brainstorming
- Industrial design conceptualisation
- Industrial product design
- Service design
- Graphic design
- User interface design
- Visualisation and animation
- Model building and prototypes
- Product, service and industrial design strategies
- Corporate image design
- Product and service appearance guides
- Industrial design and marketing cooperation
- Industrial design management and processes
- Design analysis and support





Benefits

- Positive customer and user experience
 - Aesthetically and functionally desirable products and services
 - Good usability
 - Customer-oriented solutions
 - Increased desirability of products or services
- Competitive edge with new innovative solutions
 - New product, service or business ideas
- Improved corporate and product brand image
 - Increased product or service value in the market
 - Sustainable and environmentally friendly products and services
- Industrial design strategies and management help to achieve long-term business goals
- Lower manufacturing costs and improved costeffectiveness

References

Abloy

Company industrial design strategy

Norpe

 Cooler cabinet collection innovation, conceptualisation, design and visualisation

IVT International

- Mantis loader innovation, conceptualisation visualisation and animation
- Watch the visualisation on our Elomatic YouTube channel www.youtube.com/watch?v=QnfB0NmJE0c

Cargotec

 Marketing application conceptualisation, user interface design, service design, visualisation, animation, application development and maintenance

Fiskars

Brainstorming, ideas and innovations

Iqua

Marketing application and material visualisation and animation





Visualisation

Do you want to present your products and services in an impressive and interesting way that sticks in your customers' minds? We produce eye-catching 3D visualisations in the form of animations, still pictures and interactive user interfaces.

We brainstorm the best implementation methods, themes and styles with you for different use situations: exhibitions, training, web pages, product or service launches, presentations etc.

We charge on a fixed-price basis. Based on your needs and existing materials we can quickly draw up a proposal and send you an offer. Contact us today for a fast assessment.

3D visualisation supports product development

In addition to marketing, 3D visualisation can be used to gain clear and early impressions of design objects in preliminary process and product design without the use of costly prototypes.

Visualisation use areas

- Concept presentations
- Product presentations
- Investment project presentations
- Real estate concepts
- Interior design presentations
- Software applications
- User instructions and training material animations
- Company and organisation presentations

Product & Service Development

Jani Moisala







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Imagination the only limitation

3D visualisation can be used in all situations where illustrations of complex products, structures and operations are required. Imagination is the only limit in the design and implementation of visualisations. With our experienced team and impressive calculation farm of rendering stations, we are able to complete the largest productions in a short period of time.

Services

- Animations and still images
- Interactive interfaces for any other data
- Functional simulations
- Visibility and ergonomic simulations

3D visualisation aids mechanical design

Visualisations and their initial information that are created in the preliminary design phase can be used in specific mechanical design as the visualised objects

are real and dimensionally accurate. With visualisation material we can simulate usability such as ergonomics or visibility.

Benefits

- High quality marketing materials sell better
- Enhanced credibility for products and company
- Decision making is easier with video simulation, which leads to faster design processes
- Design errors can be eliminated with simulations during the early design stages
- In many cases simulation can fully replace expensive prototypes or test products
- Representation of complex systems as an animation makes communication easier and reduces the risk of misunderstandings
- Watch Elomatic visualisations on YouTube http://www.youtube.com/user/ElomaticOY?feature=watch







Virtual Prototyping

Do you want to simulate the functionality of your design or prototype already during the planning phase? Do you want present your product using a new method that catches the eye? We offer innovative virtual solutions for different situations.

Virtual prototyping is a real-time method that replaces a physical environment or target with a 3D virtual environment to create realistic interactions between the user and the virtual model. We familiarise ourselves with your needs and existing materials and then quickly send you an offer with a suggested solution.

Application areas

Real-time presentation applications allow you to present your product in an environment where you can act and move freely. The applications can be equipped with functionalities, trajectories, and chang-

ing environments, all in a stylish photorealistic format. Give your customers a realistic experience of your product.

YouTube: Interactive Veneer Patching Line — Elomatic

In **augmented reality** virtual components are brought into real locations with the help of a display device. The display device can be a phone, tablet, separate display headset or glasses. There are diverse applications areas in sales, marketing and maintenance. Create that WOW effect!

YouTube: Augmented Reality — Elomatic

We deliver complete **simulators** from educational simulators to entertainment simulators. The delivery includes the application implementation, structural design and procurement, installation, training, user instructions and safety analysis.

YouTube: Ski Jumping Simulator — Elomatic

The design of modular targets can also be handled with the help of virtual **design applications**. Come up with a design from catalogue components and test it



Product & Service Development



in 3D. Why design everything yourself, let your customer design it for you.

Simulation applications can be used to verify the functionality of designs already during the development phase. Simulation can be used to analyse e.g. the following: ergonomics, usability, maintainability, and field of view.

Gaming applications provide new opportunities in sales and training. A tablet game at an exhibition is a good way to draw crowds to your stand and allows you to gather contact information easily.

Our **Virtual Reality Studio** can be used to virtually test and use your products. Movements and actions are created with your own body movements. You are thus able to make decisions based on the correct information when different user groups have done the testing and avoid the costly building of prototypes.

YouTube: Elomatic Virtual Reality

YouTube: Motion Capture — Elomatic

The **Oculus Rift** display headset is a high quality accessory, which we can procure for you if needed. If the application needs to be shared with several end users the more economical **Cardboard** smartphone glasses can be used.

YouTube: Virtual Prototyping with Oculus Rift — Elomatic

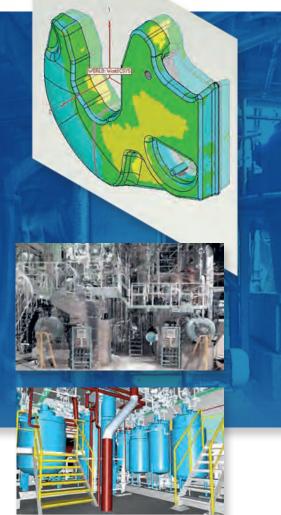
Selected references

- Central Finland Health Care District
- City of Lahti
- Jyväskylän Voima Oy
- Kotkan Energia Oy
- Kuusakoski Oy
- Raute Oy
- Sulzer Pumps Finland Oy
- Tana Oy
- Valmet Technologies Oy
- Watch our videos on our Elomatic YouTube channel: I https://www.youtube.com/user/ElomaticOY









Laser Scanning

Elomatic has over ten years' experience in laser scanning and we have several different modern laser scanners from which we choose the best suited device for each customer project. We utilise the produced point clouds to create 3D models of the objects/facilities or to produce cross section curves, define volumes and conduct shape surveys.

Rebuild objects

In plant renovations we can 3D model all existing machines, devices and constructions of the plant. The accurate 3D information facilitates and speeds up detailed design remarkably and reduces design errors. With the help of laser scanning total design costs are reduced while installation periods and shutdowns are shortened.

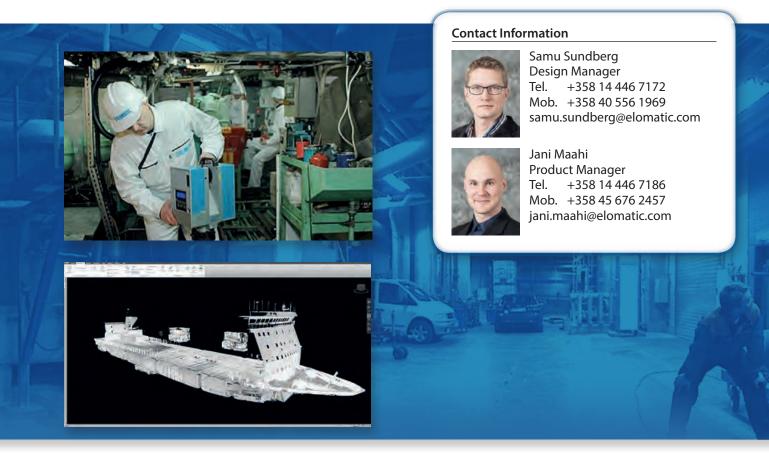
Small objects

Laser scanning also makes it also easy to study small entities. With shape analysis it is possible to study the shapes of objects and possible factory defects or damage thus become visible. Scanning creates 3D models for products which do not have drawings. The models are then used for example to facilitate strength calculations, space utilisation design or manufacturing.

Other objects

Laser scanning is also utilised in the fields of mine surveying, architecture, accident investigation, conservation of historically valuable objects and visualisations.





Application areas

- Process measuring
- Vessels
- Single components
- Terrain measurements
- Tunnels, mining
- Buildings
- Architecture

Benefits

- Safe measuring procedure
- Design is faster due to the accurate initial data
- Design errors are reduced
- Engineering risks are reduced
- New components can be delivered as prefabricated units
- Eases creation of demolition and installation plans
- Installation and shutdown times are shortened
- Amount of site visits are decreased
- Total costs are lower

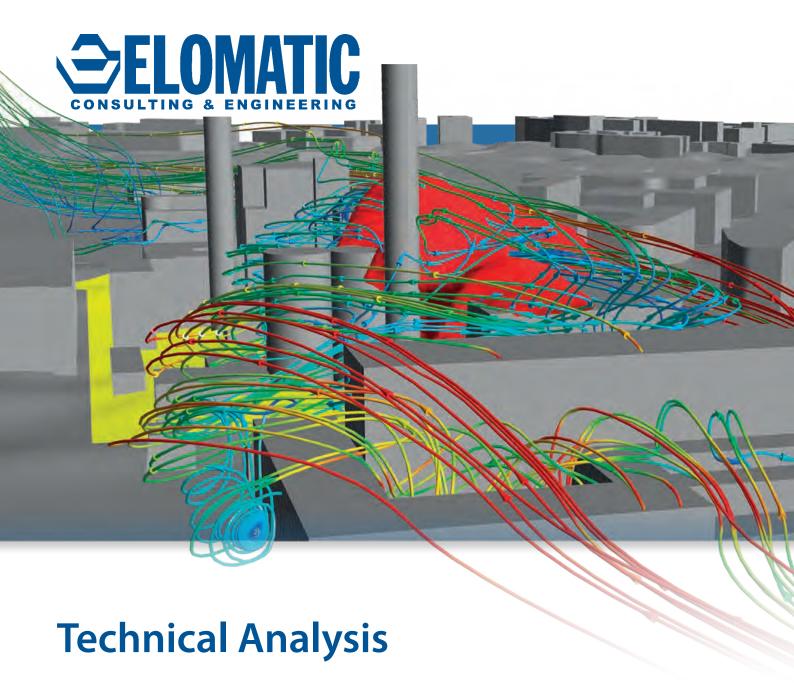
ScanBrowser – laser scanning portal

Elomatic ScanBrowser is an internet-based solution for laser scanned data. It is an easy-to-use and powerful tool for project engineers, supervisors and end customers. It allows all project partners to work with the same project data simultaneously.

The ScanBrowser solution makes it easier to work with the laser scanned data. It includes measuring functions, commenting functions and provides added value to telephone conversations.

The solution is secure and available to selected project personnel all over the world via the Internet.



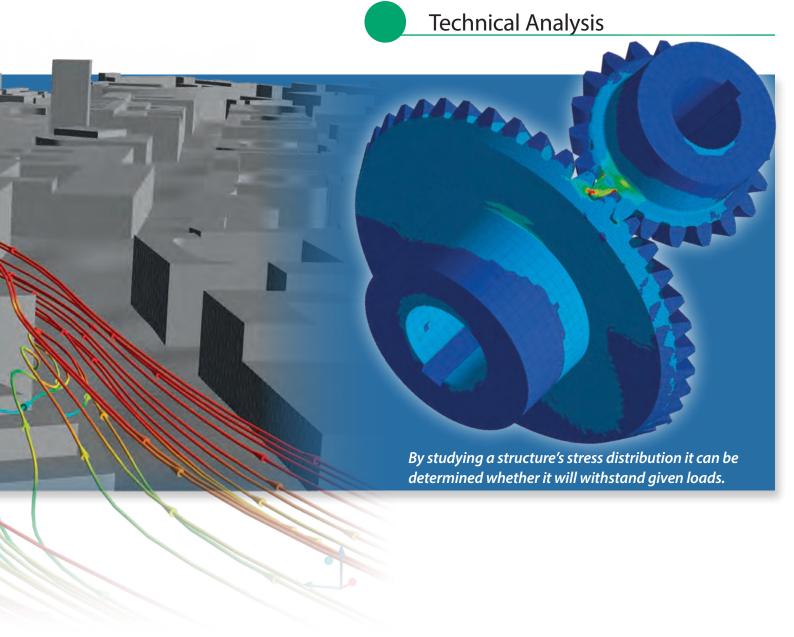


Elomatic's technical analysis team is the biggest in Finland. Our customers are small and large equipment and machinery suppliers and design offices both locally and abroad.

Full service package

Our technical analysis services include computer-aided numerical modelling of physical phenomena related to flow, dynamics, acoustics, structures and electromagnetism. The development of modelling methods is essential in order to meet increasingly challenging customer demands.

Consult us for information and ideas as to how our specialists can assist you in your ventures!



Modelling has enormous potential

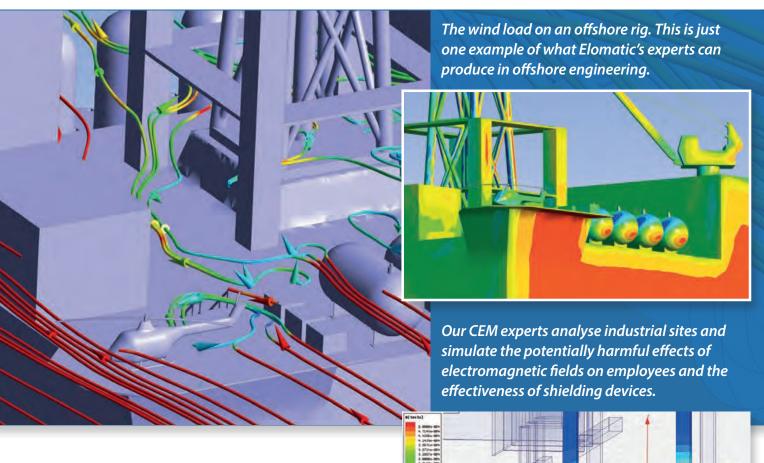
The enormous benefits of modelling have only recently been fully realised. In the past modelling methods were not applicable for practical purposes, but its use and application are currently growing rapidly in solving everyday industrial problems.

Increased energy efficiency, as well as cost reduction, enhanced environmental friendliness and faster product development are just a few examples of benefits that can be achieved with the help of modelling. Modelling also provides more detailed information about the phenomena related to applications, including those that cannot be directly measured or observed.

Technical analysis benefits

- Savings in product development
- Savings in manufacturing and product life cycle costs
- Handy comparison of alternatives
- Effortless troubleshooting
- Decreased need for prototypes
- Efficient decisionmaking support
- Enhanced environmental friendliness
- Prediction of overall results





Customer segments

- Chemicals, Food and Biomass Processing
- Pharmaceuticals
- Energy
- Machinery and Equipment Manufacturing
- Marine
- Offshore

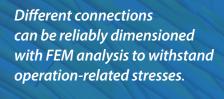
Ensuring reliability of results

We live in a world where most challenges related to industry and ordinary life are resolved with the help of suitable technical applications. They are employed to ease different activities, improve comfort and to ensure safe environments for various processes. By modelling these applications, their adequate functionality can be more efficiently assured.

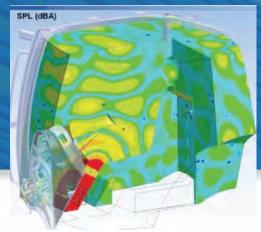
Savings and efficiency

Unnecessary costs and expensive production down-time can be avoided when computer-aided methods are used for troubleshooting. It also allows the prediction of and preparation for malfunctions or dangerous situations before they occur. Technical analysis methods promote environmental friendliness since unnecessary material losses are avoided.





Pump cavitation is a common problem, which is almost impossible to measure. With the aid of flow simulation the pump operation can be verified before prototype construction.



Acoustical simulation for tractor cabin



Computational fluid dynamics (CFD) is nowadays a commonly used method for modelling of flow and heat transfer phenomena. It is a versatile tool for studying various kinds of flow configurations and their properties in many applications.

Computational electromagnetism provides information about disturbance phenomena in electric devices and their surroundings.

CEM methods can be combined with structural analysis in order to perform even more detailed studies and to understand interactions between structures, flows and possible electromagnetic forces.

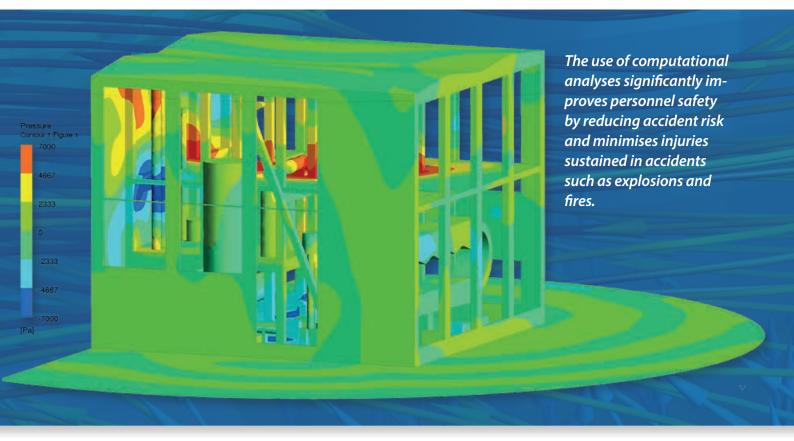
CFD with aeroacoustics

Using CFD with aeroacoustic techniques on complex fluid-structure interaction allows engineers to check acoustic effects, noise defects and noise attenuation. By adhering to standards and conducting professional studies, industry can reduce noise in the environment and reduce the risk of injury to employees.

Multibody Simulations (MBS)

MBS are widely used to design mechanical systems, to predict loads accurately, and to understand the dynamics of mechanics. With MBS, it is possible to study how mechanical systems should be controlled when the system contains several moving parts and complex interactions.





Selected References

GEA Bischoff

Electrostatic precipitator CFD modelling

 Optimising collection efficiency via trimming flue gas flow. Flow profiles and pressure losses.

Konecranes

World biggest Goliath gantry crane HVAC CFD modelling

 Number of fans and placements. Cooling inside 210 meter long crane with heat transfer taking account of Brazilian climate and sun radiation.

Kotkan Energia

Electrostatic precipitator CFD modelling

■ Flow correction in different parts of ESP for increasing particle collection efficiency.

Combined FEM calculations

LNG -162°C evaporator heat exchanger

■ Thermal/heat transfer/stress/fatigue analysis CFD/FEM

Heat transfer with FEM

Pressurised chamber 400 bar/500°C

- FEM thermal calculations (steady state and transient heat transfer analysis (conduction, convection and radiation)
- Pressure vessel calculations

MW Power

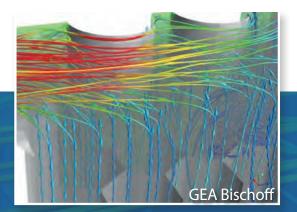
Heat transfer CFD modelling

 Fluid-steel-flue gas connected heat transfer in complicated large scale geometry. Particle tracking, heat transfer coefficients, heat fluxes, dew points.

FEM calculation

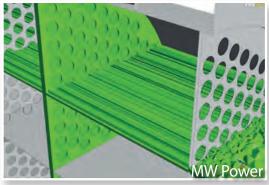
LNG -162°C pipe stress analysis

- FEM calculations
- Pressure vessel calculations
- Pipe stress calculation









Related services

- Energy, p. 26
- HVAC Engineering, p. 92
- Machinery and Equipment Manufacturing Industry, p. 32
- Marine Industry, p. 40
- Mechanical Engineering, p. 94
- Offshore Industry, p. 52
- Process Industries, p. 14



Technical Analysis

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